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**THE TRUE BOOK ABOUT  
SCIENCE AND CRIME**

# THE TRUE BOOK ABOUT SCIENCE AND CRIME

*by*

RICHARD HARRISON

*Illustrated by*

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FREDERICK MULLER LIMITED  
LONDON

H. PROSPERITY & SONS  
STAR MANSION,  
CLARE ROAD,  
BOMBAY 8

FIRST PUBLISHED BY FREDERICK MULLER LTD.  
PRINTED IN GREAT BRITAIN BY EBENEZER BAYLIS AND SON, LTD.  
THE TRINITY PRESS, WORCESTER, AND LONDON  
BOUND BY THE DORSTEL PRESS LTD., HARLOW



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SECOND IMPRESSION JANUARY 1958  
REVISED EDITION MARCH 1960

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## INTRODUCTION

**D**IAL 999!  
"Police, Fire or Ambulance?" you are asked.

Police, perhaps. A burglary or even a murder.

Those simple movements of pushing round a telephone dial, which require no skill and very little effort, put into operation forces to which the knowledge of human beings, the intricacies of mechanical inventions and the latest developments of science all contribute.

We take the automatic telephone for granted; we also take the police for granted and complain of their inefficiency when they fail to arrest a murderer or to recover stolen property.

This book explains something of the problems that face the police to-day in their fight against crime, it also tells you how daily and hourly they call on the knowledge and experience of scientists in all fields to help them.

It suggests a few experiments you may like to try out for yourself. Please take particular care in carrying these out. None of them calls for operations of a dangerous nature, and those relating to guns and bullets should be confined to unloaded weapons and spent cartridges which you may be able to obtain with proper permission.

The police have too much to do already without your adding to their work!

If you are interested in scientific detection, cultivate the habit of being scientific: clear thinking, keen observation and accurate working are all habits that can be established without any special talents.

At school I used intensely to dislike quantitative analysis in the lab.: it seemed pointless and boring. Now I know that a careless measurement or calculation may point suspicion at an innocent man or help a crook to escape justice. A man has died suddenly: poison is found in his body. Did it cause his death? To-day scientists know how much of a given substance is required to produce fatal results. Only the most careful analysis and measurement can determine whether the dead man had sufficient poison to cause death, or whether he died from natural causes. Remember that many substances which are quickly fatal in large doses have valuable curative properties when administered in small quantities.

You may be a little disappointed when I debunk your favourite fiction detective, but I think you will end up by gaining a real admiration for the police detective and the experts who help him.

# *Chapter One*

## THE REAL DETECTIVE

**I**F you've read any of the stories in Conan Doyle's Sherlock Holmes series, you probably picture the really clever detective as a superman who carries out all the work of tracing a criminal single-handed.

To his amazing powers of observation and deduction he adds a profound knowledge of science. He makes complicated tests and experiments in his own laboratory; he is familiar with every type of soil in England, and can tell from a glance at your shoes where you spent your holiday; he recognizes a brand of cigarette from a speck of ash on the carpet; a single fingerprint at the scene of the crime leads him instantly to the murderer.

In real life the detective isn't a bit like that. He wouldn't be much use if he was! He could only solve one crime at a time, and unfortunately there are dozens of crimes every week in every big city.

If there is a private detective living with the powers of Sherlock Holmes, I would still back

the Criminal Investigation Department of any large police force to find the crook first.

Why? Because crook catching is a matter of method and organization—team work, in fact—rather than of individual brilliance.

I said Criminal Investigation Department. That is the department which is primarily concerned with the detection of crime and the arrest of criminals. Every police force, except the very smallest, has a Criminal Investigation Department, or C.I.D. as it is usually called. Don't get the idea that C.I.D. stands only for Scotland Yard.

The men and women who make up any C.I.D. are police officers who have been trained as detectives, after they have proved that they possess special qualities of patience, persistence, observation and understanding of human nature.

They are not taught to be scientists; what they do learn is just how far science can help them. In other words, they know where to find the answers to their problems, which is more useful to society than if they tried to learn all the answers themselves.

Detection is a matter of team work, with the detective officers as the forward line. To back them up they have the Criminal Record Office, the Fingerprint Department, the Home Office Laboratories of Forensic Science,\* and the services

\* The police don't own the laboratories: they are staffed by Civil Servants. Forensic Science is just science applied to legal uses.

of doctors and scientists, not to mention the co-operation of every police constable in uniform.

Let us consider an actual case which will show how the team operates and how scientists are called in to help at almost every stage.

I have chosen murder because a murder case



Outside the door of one of the basement flats he saw a man  
swaying

calls for the use of almost all the resources at the command of the police. You must not think that detectives spend most of their time hunting murderers. In England at least there are very few murders: in London (Metropolitan Police District) in 1958 there were 151,796 indictable offences (i.e., offences against the law for which the suspects

can be *charged*, as opposed to minor offences such as car parking violations for which summonses are issued), and of this huge total only thirty were murders, and of these thirty murders only three were capital murders under the 1957 Act.

The murder with which we're going to deal now took place in London in 1948. It was not a cold-blooded, deliberately planned crime—very few murders are, outside the pages of fiction. The killer did not set out with any intention of physically harming anyone.

In the early hours of Boxing Day the porter on duty in a large block of flats in Marylebone heard a cry of distress. He listened carefully, believing at first it was no more than a shout from some protracted Christmas party. The cry was repeated, and the porter rushed down to the basement whence it seemed to come.

Outside the door of one of the basement flats he saw a man swaying. His head was covered with blood and he was trying to staunch the flow with a towel.

The porter led him back to his room and laid him down on the bed. Then he telephoned for an ambulance. It happened that the ambulance was already on its way, and it is believed that the victim must himself have telephoned, for he was perfectly conscious, though he had no idea how he had received the injury.

In hospital the surgeon found that a piece of bone had been driven against the brain. An operation was performed, but the victim, Mr. H. S. Michaelson, a professional artist, died on December 27th without recovering his memory.

Early reports from the hospital showed that Mr. Michaelson could not have inflicted the injuries himself, either deliberately or accidentally. The police were called in, and detectives made a methodical routine examination of the flat.

Working on the case were two of Scotland Yard's ablest officers, Detective-Superintendent Beveridge and Divisional Detective - Inspector Jamieson. They were soon satisfied that Mr. Michaelson had been deliberately attacked, but their first theory was that a thief had entered the building on Christmas night and joined one of the many parties that were being held in the hope of being able to steal something unnoticed.

What followed was far from dramatic, but it does illustrate normal routine in such a case. Police officers called on the occupants of every flat to inquire whether they had noticed any strangers or heard anything unusual during the evening. These inquiries yielded no results at all, and the detectives turned their attention to the possibility of the intruder as having entered the flat from a window. They could see no signs of any window having been forced.

The bed-sitting-room of the flat provided the one important clue. This was a tubular metal

chair, and on it were patches of what might have been blood.

The chair was sent to Scotland Yard for further examination. Laboratory experts soon proved that the patches *were* blood, and that the blood belonged to the same group as the victim. The



The bed-sitting-room of the flat provided the one important clue

chair had other things to tell, for fingerprints were found on it, and these were compared with prints in the huge collection of Scotland Yard's Fingerprint Department. They were identified as belonging to a young man with a criminal record, Harry Lewis. Immediately a general call was put out to all police officers to find Harry Lewis and "pull him in".

The wife of the dead man had been away from home at the time of the tragedy, but she was able to give the detectives very valuable help. She knew roughly how much money there should have been in the flat, and she knew her husband was accustomed to sleeping with the window open. No money had been found when the police examined the room after the crime.

You remember the flat was in the basement of the building. The detectives found that the window was just below pavement level, with a little area in front of it protected by railings. A determined thief could have vaulted the railings and got in through an open window. The detectives knew from the record that Harry Lewis was just such a thief.

And really that was the end of the case, except for the finding and arresting of Harry Lewis. He was caught on January 18th, and charged the next day with murder. He pleaded not guilty, as most murderers do (and, indeed, Judges always advise them to), and quite freely filled up the gaps in the story. He was, he said, groping his way round the flat after climbing through the window and had actually found a wallet, when someone called, "Who's there?" He heard the occupant get out of bed and he panicked. The metal chair was by his hands; he picked it up . . . "I admit I gave him two bashes."

Lewis' intention was to prevent Mr. Michaelson holding him, not to kill, but the law is quite clear

on the point: if while you are committing a crime (in this case burglary) you cause the death of another, you are guilty of murder.



A determined thief could have vaulted the railings and got in through an open window

Lewis was found guilty, although his counsel put forward a theory that Mr. Michaelson might not have died if the operation had not been per-

formed. He suffered the full penalty of his crime. The case was simpler than many, but it illustrates just how detectives in real life rely on team work and on experts, instead of trying to solve everything single-handed.

Here the detective in charge relied first on his subordinates to call on every resident in the huge building. (Think how long that would have taken, if he had had to do it himself!) Then he called in the pathologist to examine the injuries and to give his opinion on how they could have been caused. He depended on the laboratory scientists to discover that the blood on the chair belonged to the same group as the victim, and on the fingerprint experts to develop and identify the fingerprints. He needed photographers to make exact records of the flat, and he had the help of every police officer in the country, once he knew whom to suspect.

As a result, Lewis was caught in less than three weeks by science and team work. The way in which the scientists, the Criminal Record Office and the detective work together is itself a science.

But remember that science alone cannot solve crimes. It needs first the observation of the detectives to provide material for the scientists to work on.

# *Chapter Two*

## SCIENCE AND BLOODSTAINS

CASES of murder or serious bodily injury, caused by a sharp or blunt instrument, often result in the victim's losing a quantity of blood. Sometimes this blood provides an important clue to the guilty party, though its message is seldom one that the detective can read without the aid of the scientist.

In the case of a murder it is often extremely important that any blood on or near the victim should be carefully examined, and this can only be done in the laboratory. The reason for this examination is that some of the blood may not belong to the victim, but to his attacker.

As you probably know, all human blood is not the same (though distinguished ancestry doesn't turn it blue!). It does, in fact, belong to one of four groups, which are now known all over the civilized world as A, B, AB and O. Suppose the victim's blood belongs to group A and some blood of group O is found on his clothing: it is then reasonable to suspect that he was attacked by someone with group O blood.

Actually the blood group tests are more useful to protect the innocent man than to convict the guilty. It could work out this way: the police question a suspect and he consents to have a blood test taken. It is found that his blood group is B, so the blood on the victim could not have come from the suspect. On the other hand, if the suspect's blood group had been O, it still wouldn't prove him guilty, as millions of other people have group O blood.

I remember one case where the blood test certainly removed suspicion from an innocent man. The police were investigating what appeared to be a particularly brutal murder in a big city in the north of England (later it proved to be only manslaughter) and during the course of their work they called at all cleaners and asked if anyone had left a bloodstained suit for cleaning. (This, by the way, is typical of police routine; you will remember I told you how difficult it would be for a single detective to solve a case by himself—imagine how long it would take to call on all the cleaners in a big city!) At one shop they learnt that a suit had been brought in, apparently badly stained with blood, and the man who had brought it was a stranger, not a regular customer. This shop was in a rather poor part of the city, and the manageress mentioned that she had been surprised because the customer didn't seem the class to come there.

As you can imagine, the detectives were quite

excited. They waited for the customer to come back, and when he did, they tackled him before he had time to invent an explanation. His story was that he had taken too much to drink and insulted a friend who promptly punched him on the nose. That was where the blood had come from, and he was too ashamed to take the suit to a shop where he was known!

The suit was sent to the laboratory for examination where it was found that the blood belonged to the same group as the owner, and to a different group from that of the victim of the crime.

Far more positive was the evidence supplied by a bloodstain in the case of a murder which took place in Fulham, London, in 1948.

The body of a woman was found in the area of a house, and at first it was believed she had fallen from an upstairs window and been killed by the fall. The pathologist who made the post-mortem examination considered that the injuries were more consistent with blows from a blunt weapon, and Scotland Yard promptly investigated. They found a carpet in the front room of the second floor which bore a large area of stain. This had the appearance of blood, but when the occupier of the flat was questioned, he declared he had spilt some red ink there. It isn't very difficult for a scientist to determine the difference between blood and red ink, and the staff of the laboratory which is attached to Scotland Yard soon discovered that not only was this stain blood, but it belonged to

the same group as that of the dead woman. Further, search in the flat revealed a hammer and flat-iron, both bearing traces of blood of the woman's group. The man was found guilty of murder: he was not executed, as this occurred at a time when Parliament had temporarily suspended capital punishment, although the law had not then been altered.

Here is a rather less serious story about bloodstains. Two keen anglers went fishing in their favourite lake in Yorkshire. It came on to rain, and they ran for shelter to an old boat house. No sooner had they opened the door than they recoiled in horror: the floor was covered with fresh blood! They rushed to the nearest house and telephoned the police. The police themselves suspected a ghastly crime—until experts from the Home Office Laboratory convinced them that the "blood" was nothing more sinister than a type of red fungus which sometimes develops on rotting wood in warm, damp weather!

I told you human blood was divided into four main groups. It can now also be sub-divided into an almost unlimited number of sub-groups, and these sub-groups can be discovered in the laboratory, if the blood is fresh. When it comes to finding bloodstains on the clothing of a suspect, these are usually so stale that they can only be used for determining the main group.

It did once happen that very prompt police action enabled the scientists to prove that blood on a suspect came from the victim. This was in



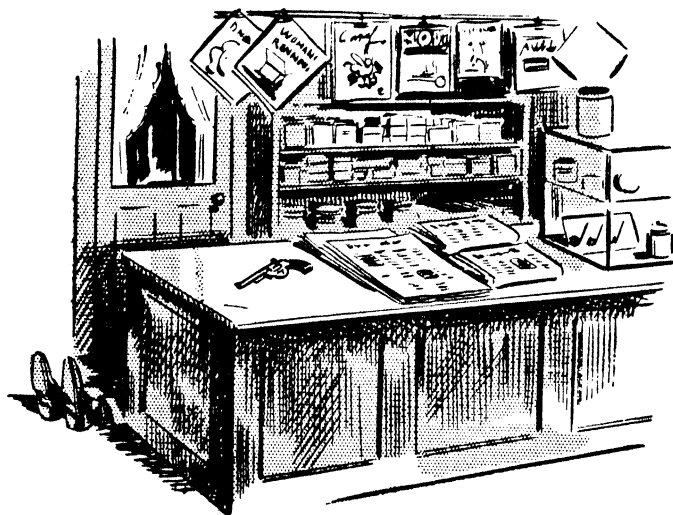
No sooner had they opened the door than they recoiled in  
horror

Falmouth, Cornwall, on Christmas Eve, 1942. Late in the afternoon a tobacconist was found dead behind the counter of his shop. From his injuries it was obvious that he had been brutally murdered.

On the counter of the shop was a revolver and this was a most important clue, for it had been reported to the police as stolen some ten months before.

The Falmouth police looked up their records of the revolver theft and found that it had disappeared from a ship which was being unloaded in the harbour. Fourteen men had been unloading the ship, and one of them, a labourer named Trenoweth, had been strongly suspected, though nothing could be proved against him. He was a man known to the police as a bad character.

Trenoweth was found at home and questioned about his movements. He was still in bed (it was now very early on Christmas morning), and one of the detectives noticed stains on the cuff of his shirt and on the front of his coat. The coat was immediately sent to the Home Office Laboratory



On the counter of the shop was a revolver and this was a most important clue

at Bristol, together with a sample of the dead man's blood.

The police had acted so promptly that the stains on Trenoweth's clothing were still wet, and it was possible to show not only that these stains were blood belonging to the same group as the tobacconist, but that they belonged to his subdivision. The chances were hundreds to one that



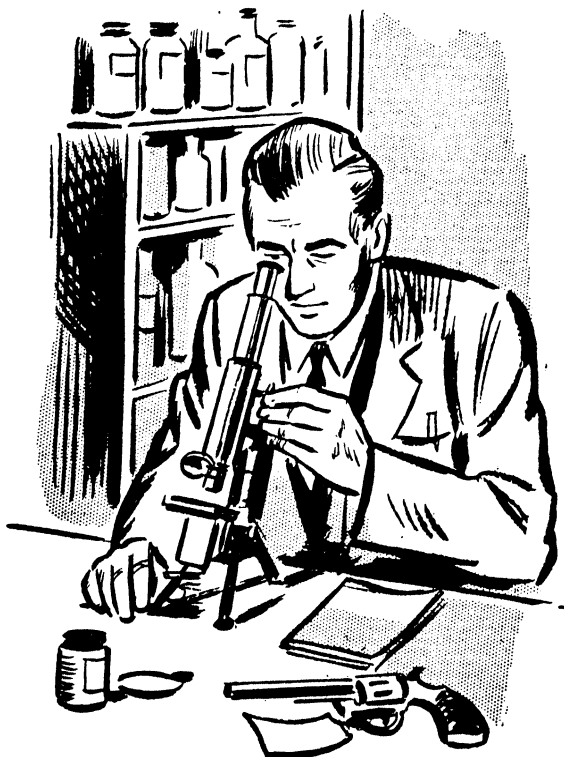
One of the detectives noticed stains on the cuff of his shirt and on the front of his coat

any other person having that particular subdivision of blood should have spilt some on Trenoweth's clothing, and he was arrested and charged with the murder.

You know that in English law a man is presumed innocent until he is proved guilty. The law goes further than this, and says that when a man stands his trial before a jury, the jury must only hear evidence against him on the case for which he is being tried. The prosecution is not allowed to say that there were strong reasons to suspect him because he has a criminal record, or even to mention he has been in trouble before. You will understand from this that very strong evidence is required to convince a jury who know nothing at all about the accused man.

In the case of Trenoweth, the police were quite

sure he was guilty, but, as is often the case, they needed further proof to convince a jury who might not fully understand the complicated details of blood tests.



Under the microscope at the laboratory the fibres on the revolver were shown to be identical with those of which the carpet had been made

With the help of experts, they built up a very formidable case. On the revolver were a few fibres of cotton or wool. When they searched Trenoweth's

house, they found an old carpet in the attic. Under the microscope at the laboratory, the fibres on the revolver were shown to be identical with those of which the carpet had been made. It was obvious that Trenoweth had stolen the revolver and hidden it in the carpet.

Scientists and police combined to produce one more piece of evidence that clinched the matter and secured Trenoweth's conviction. In his possession was found a pound note that had been torn and neatly mended with gum and paper. A witness was found who had seen the tobacconist mending a torn pound note, and the detectives found paper in the wastepaper basket of the shop from which a strip had been cut that corresponded exactly with the strip used to mend the note. They also found a bottle of gum, and when this was analysed in the laboratory, it was found to be the same gum as had been used to stick the paper.

Sometimes the position and shape of bloodstains have stories to tell the detectives. Splashes of blood on a wall once showed ex-Divisional Detective-Inspector Jack Henry of Scotland Yard, that a dead man had been attacked with a knife which had been drawn back quickly for a second blow. Blood had flown off the knife and struck the wall in small drops which showed the direction in which it was travelling. The ragged edge of a droplet, or the end which has a narrow neck followed by a smaller droplet, is always away from the direction in which the blood was travelling. This, of course,

applies to any heavy liquid. You have probably seen ink stains like that.

Owing to chemical changes, bloodstains very often look quite unlike blood after a few days or even hours. Dyes in wall-papers, for example, may cause the stain to become green, blue or yellow, and detectives never decide that a stain is not blood until it has been tested in the laboratory.

Sometimes a stain is fresh and quite obviously blood, but is it human blood? The microscope can soon tell, because the red corpuscles of human blood are a different shape from those of any other living creature.

Even when bloodstains have been washed from clothing, floorboards or carpets, it is sometimes possible to tell under ultra-violet light that the stains are in fact still there. A perfectly white handkerchief, for example, may show a dark patch when the "black light" is turned on it. You will read about this "black light" in another chapter.

If you are interested in experiments, here is a quick test for bloodstains which is effective, even when the blood has long been dry. Get the chemist to make up the following mixture for you:

|                       |        |          |
|-----------------------|--------|----------|
| Leuco-malachite green | ...    | 1 gr.    |
| Glacial acetic acid   | ...    | 100 c.c. |
| Distilled water       | ... .. | 150 c.c. |

You will also need a bottle of peroxide of hydrogen such as you can buy at any chemist or at Woolworths.

When you are ready to make the test, three-quarters fill a test-tube or small glass with the mixture and top it up with peroxide of hydrogen. Now scrape some of the suspected stain from the surface where it occurs, and place it on a clean piece of filter-paper.

Moisten the scrapings with a drop of distilled water. Wait a few seconds for it to soak, then with a glass rod add a drop of liquid from the test-tube. If the stain is blood, the wet portions of the filter-paper will turn green after ten seconds, and within a minute will turn to deep greenish-blue.

If the stain occurs on white cloth, you can dampen the cloth with distilled water and apply the mixture direct. On coloured material it is better to moisten the stain and then press the filter-paper gently against it, applying the mixture to the damp patch on the paper.

This test will only show whether a stain is blood or some other substance. It cannot pick out *human* blood.

I hardly need tell you that if you ever do come across a real crime, you must never attempt to carry out blood tests or any other tests. You have two definite duties as a good citizen: to touch nothing, and to prevent anyone else touching.

# *Chapter Three*

## BURGLARY AND HOUSEBREAKING

**B**URGLARY and housebreaking call for scientific investigation on the part of the detectives themselves.

But here again the arrest of the thieves often depends on methodical inquiries by dozens of police officers, rather than on brilliant deductions by the detective in charge. It also depends on reference to the detailed files of the Criminal Records Office, usually abbreviated to C.R.O. Every police force has a Criminal Records Office, but copies of the records are also sent to Scotland Yard which has a complete list for the whole of England.

The compiling and indexing of these files are in themselves a science; without the records the fight against crime would be much more difficult.

You learnt in the first chapter that murders form a very small proportion of all crimes committed. Out of London's 151,796 criminal offences in 1958, only 1,961 were offences against the person (which includes 30 murders, and 1,859 cases of wounding and assault). Nearly all the

rest were concerned with the wrongful taking of other people's property. Among them were 993 cases of burglary, 9,943 of housebreaking,\* and 14,061 of breaking into offices, shops and warehouses. Minor thefts of money and property stolen were over a million pounds. Although there were comparatively few cases of burglary and housebreaking, they accounted for nearly half of the losses, so you will see that burglary looms very large at police headquarters.

By now you're probably wondering where the "science" of criminal records comes in.

If you have read the newspapers recently you must have noticed that there have been several cases of burglary which involved the theft of jewellery worth thousands of pounds. Some papers have stated that one gang has been responsible for several of these raids.

Gang raids are carefully planned—quite often in prison. They require the services of several "experts", you may be surprised to learn. The thieves will need, first, a plan of the house that is to be robbed, together with knowledge of the family. It is important to know the best hour for carrying out the raid. They will want a driver who can choose and steal a fast car, and disguise it quickly. Yet another man will be needed to break into the house and to pick or force the

\* Burglary is breaking into a dwelling-house between the hours of 9 p.m. and 6 a.m. It is regarded as a much more serious offence than housebreaking, which can only take place between 6 a.m. and 9 p.m.

locks of doors and safes. The man who actually removes the plunder must be able quickly to place a breaking-up value on jewellery. Some pieces are not only useless but dangerous from the thieves' point of view, because they are so well known that they can never be sold unless broken up, and once broken up into individual jewels are worth very little. The value in such a case depends on the skill employed in mounting the gems.

Above all, the gang needs a "fence".

The "fence" is a crook who buys the jewels from the thieves, and afterwards disposes of them—usually to his own great advantage. A burglar friend of mine told me that in a gang burglary where jewels worth £15,000 were stolen, the "fence" only paid £1,500 to the gang.

Sometimes the "fence" organizes the whole raid and pays the operators a sum agreed beforehand.

But the science of criminal records?

I told you these big raids were sometimes planned in prison. Even if they are not, they are seldom possible without the help of at least one man who has already served a prison sentence.

That's the secret! Once a man has been convicted of a crime, the Criminal Records Office knows quite a lot about him. The C.R.O. has what it calls a *modus operandi* room, in it are files of master cards which contain not only every convicted crook's photograph, description and fingerprints, but also an amazing number of details about his methods, his haunts and his habits.

Burglars, and indeed crooks of all kinds, have a habit of sticking to one type of crime and to one method of committing that crime. The safe robber who uses explosives to open a safe very seldom tries skeleton keys or other methods. Why this should be so, I'll try to explain in the chapter on Detection and Psychology.

When the police have been notified of a big burglary, the first to arrive on the scene will probably be the occupants of the nearest radio patrol car. Their duty will be to see if the thieves are still in the vicinity (and to detain them if they can!), and to prevent anyone from disturbing what may be important clues.



The first to arrive on the scene will probably be the occupants of the nearest radio patrol car

When the detective officer assigned to take charge arrives, he will look for signs that may interest the Criminal Records Office.

How were the premises entered? How did the burglars open the safe? These are two questions to which the detective must find the answers.

After going round the outside of the house he discovers that a stack-pipe has been climbed and a bedroom window entered. That calls for skill and daring. The C.R.O. has files of say a hundred convicted thieves who make a habit of entering by means of stack-pipes. Rather a tall order to look up a hundred (and there may well be a thousand) ex-convicts and ask about their movements on the night of the crime, especially as they will all have alibis which will have to be checked!

But that isn't all the detective finds out. In order to swing safely across from the pipe to the window, the crook has used a steel hook such as fishermen use for gaffing their catches. The hook has left its mark on the window-frame. C.R.O. knows of ten men who use hooks for that purpose: the list is becoming a little more reasonable now.

While the detective in charge is making his investigations, other police officers are inquiring all round the district about strangers. They concentrate on public houses, restaurants and coffee stalls, but they don't neglect shops and even private houses.

In one little café the waitress remembers a customer who seemed rather agitated. He kept

looking at his watch and drumming his fingers on the table. No, she couldn't describe him, but she did notice a scar on the back of his hand. C.R.O. has a file specially for crooks with scars on their hands! This is examined, and the names are found of three men with convictions for jewel robbery. Of these three one had once been caught after he had climbed a stack-pipe and used a hook. There is a very good chance that this man knows quite a lot about the burglary!

It isn't always quite as simple as that, but broadly that's how the police make use of the science of Criminal Records.

Sometimes the experts from the laboratory visit the scene of the crime and find evidence that no detective could hope to discover alone.

Such a case occurred in Kent a few years ago when thieves raided a fur store and stole furs worth hundreds of pounds. There was only one slender clue: a woman remembered the number of a car that had been left beside the kerb at the time when the robbery must have taken place. The police found this car abandoned miles away: they learnt that it had been stolen some days before.

Experts from the Scotland Yard Laboratory examined the fur store and the car. In the car they found hairs which, under the microscope, were identical with those on furs similar to the ones which had been stolen. The police now knew that a stolen car had been used at some time for carry-

ing valuable furs, and the chances were they were getting warm. Something else was found in the car—fragments of jute from a jute carpet.

By now the police were making their usual area inquiries. They found that a man and a woman had disappeared from a flat they had rented without giving notice. There was a carpet on the floor of the flat, and when this was examined, it was found to be of jute, dyed the same colours as the fragments in the car. It looked very much as though the missing couple had stolen both car and furs. Of course, several people could give a description of the missing couple, and it was not long before they were traced and detained in quite another part of the country. The man's suit and shoes were sent to the laboratory for examination. Wedged in the rubber heels of the shoes were fibres of jute identical with those of the carpet, and in the turn-ups of the trousers were hairs identical with those of the furs.

The final piece of evidence came from a few lengths of black-out material which were found in the flat. After the war, as you can well imagine, there was plenty of black-out material going cheap, and a large quantity had been turned into bags for storing furs. To the unaided eye, one piece of black-out material looks much the same as another, but the microscope can tell a different story. The pieces in the flat had a tiny flaw running right across them: so had the bags remaining in the store!

The man and woman were both convicted of stealing the furs and sent to prison.

I don't suppose you're very interested in statistics, but Scotland Yard is—it has to be.

A very important section there is concerned with preparing statistics, and as a result the police know quite a lot about the habits of burglars and housebreakers. This knowledge enables them to stop a lot of crime before it happens—and stopping crime before it happens is the most important work the police have to do, even if it isn't the most spectacular. Statistics show, for example, which districts of London have the most crime (actually it is the West, not the East, End), the hours at which most crimes take place, and, in the case of burglary and housebreaking, the methods most used.

Television has altered the habits of thieves, and their hours of "work" vary in winter and summer.

During the hot weather—when we get any!—housebreakers make their rounds during the afternoon when father is at work, the family at school and mother taking an airing in the park. In the winter they call just after supper when the family is at the pictures or seated round the T.V., oblivious to all other sights and sounds. About eight o'clock is a popular hour, as it avoids a charge of burglary if caught.

Although the police know from statistics that so many robberies will occur every year, they have no means of telling where they will occur, and because the vast majority of thieves (apart from

jewel robbers) take money or articles that are hard to identify and easy to dispose of, not much of the stolen property is recovered. This does not mean that the robberies are never cleared up. Sooner or later the thief is caught, and the police, who have a record of his methods, put it to him that he has been guilty of a number of other offences. If the thief is wise, he admits these, and at his trial asks that they may be taken into consideration by the judge when he passes sentence. If he is obstinate and refuses to admit the other offences, he is liable to be tried for each one separately, and, of course, his aggregate of time in prison will be much longer.

Most thieves give themselves away, even if they are not caught in the act. They just can't help making a splash with their newly-acquired wealth. Friends are treated to drinks, new clothes are bought and heavy bets are placed on dogs and horses. It is part of the routine work of a detective to find out when "shady" characters in his territory have a lot of money to spend, and he makes it his business to learn where that money has come from.

I can remember only one thief who had a really big run of success—and he, too, was caught in the end. The secrets of his long freedom were the ability to work alone, to keep his mouth shut, and not to throw about the money he had stolen.

He became almost a legend at Scotland Yard who nicknamed him Flannelfoot. He started

operations about 1926, and each night he would enter one or more houses in the suburbs of London. He never went upstairs, and never stole anything except money and cigarettes.

Before the end the police actually knew who he was and where he lived, but they could not arrest him because he never stole anything that could be identified. To secure a conviction it was necessary to catch him red-handed, but the police never knew where he would strike next.

They paid him the compliment of putting some of the finest detectives in Scotland Yard on his case, and plans were prepared like those for a major battle. A map of London was marked with flags to show where he had committed burglaries, and the detectives worked out by the law of averages where he would strike next. It was quite useless to attempt following him. He had eyes like a hawk and seemed to know instinctively if he was being "tailed". All the police could do was to make a guess on his next area of operations and hide there. Sooner or later, also by the law of averages, that would have to be right. And it was. In 1938 he was caught actually coming out of a house.

It was estimated that he had made an income of £10 a week for twelve years by burglary!

But he *was* caught, and by scientific detection, even if the laboratory could not help.

# Chapter Four

## THE SCIENCE OF FINGERPRINTING

SOME people regard fingerprints as a sort of magic which instantly reveals the identity of a criminal.

Others imagine that a really clever detective carries in his head pictures of the fingerprints of all the crooks there are.

Neither is true, yet the science of fingerprints, which is less than a hundred years old, is the most important single weapon in the fight against crime. It is the one absolutely certain method of establishing identity.

Scotland Yard has a very large Fingerprinting Department, staffed largely by Civil Servants, not police officers. The work of the Department is exacting routine which requires close attention. Every single fingerprint in the collection of over ten million belongs to a crook—which doesn't mean that there are ten million crooks in the country, because nearly every crook has ten fingers! And, of course, some of the crooks are foreigners who pay us unwelcome visits from time to time.

How did Scotland Yard make such a huge col-

lection? The crooks themselves contributed to it by having their fingerprints taken when they were convicted.

So the collection consists only of prints from crooks who have actually been caught.

That may sound rather disappointing and unspectacular. It isn't really. Let's learn a little more about fingerprints themselves before we deal with their uses.

What are fingerprints? Of course they're the marks left by fingers when they touch a surface capable of receiving an impression. (There are three sorts of impressions which will be explained shortly.)

Why are the marks which fingers make useful and important? That brings us to one of the two facts about fingerprints which matter.

*No two people make the same fingerprints, not even identical twins.*

The chances against any two people making exactly identical prints are 64,000,000,000 to one! Suppose X breaks into a house with a jemmy and leaves the jemmy behind with his fingerprints on it: suppose the Fingerprint Department has a record of fingerprints identical with those on the jemmy and they belong to Alf Smith, then we know for certain that X equals Alf Smith. It's as simple as that—though it may not be so simple to find and arrest Mr. Smith!

And there is only one more fact to learn about fingerprints: *they never change.*

Take the fingerprints of a baby a few days old, take them again in ten, twenty or fifty years' time and the patterns will be exactly the same.

Let's study these patterns a minute. Have a look at your own fingerprints: you'll find a series of fine lines on the palm side. Get a magnifying glass and have a closer look. You will see that they never run straight for long, but curve and fork, and sometimes stop short.

By now you will have discovered that the patterns are not the same, even on each of your own fingers.

There are four main patterns: arches, loops, whorls and compounds. See if you can identify your own pattern from the illustrations below:



Arch

Loop

Whorl

When fingerprints are filed for reference in the Fingerprint Department, they are first filed according to the main pattern on each finger. There are many sub-divisions, and classification has been

worked out so scientifically that it takes only a matter of minutes to match a given set of prints from the records (if the prints belong to a convicted crook, that is, otherwise they won't be there).

When only a single fingerprint is found at the scene of a crime, a different system of classification is employed which depends on accurate measurements. Naturally it takes considerably longer to match a single print.

Now let's see how and when the detective can make use of fingerprints.

First, the case I gave at the beginning of this chapter. A fingerprint has been found at the scene of a crime. If the print is found on a small object that can be moved, the article is carefully packed and sent to the Fingerprint Department, where experts will try to match it from the files. If they are successful, the detectives will know the name of the man they want, and that he has already a criminal record. That's the most direct use of fingerprints. You will realize that convicted crooks are careful about their fingerprints and often wear gloves: at least they carefully wipe anything they have touched.

Here is another important use of fingerprints. A thief is caught, say, in Liverpool. The police wish to know whether he has a criminal record, as they will have to inform the Judge if he is found guilty at his trial. (The Judge will usually impose a stiffer sentence if the man has a bad record.) His fingerprints are taken and sent to Scotland Yard's

Fingerprint Department, and word will soon come back if his prints are on the file.

When a man is sentenced for a criminal offence for the first time fingerprints are taken, and not only is a copy filed at the headquarters of the local police, but another copy is sent to Scotland Yard for the national record.

Copies of the fingerprints of international crooks, such as confidence tricksters and forgers of bank notes, are circulated to most police headquarters in the world, and are also filed at the headquarters of the International Commission of Criminal Police in Paris.

Now suppose a fingerprint is found at the scene of a crime, but neither the local headquarters nor Scotland Yard can match it. The print isn't just thrown away, it is placed in a special file. When the police come across a similar crime, they will compare the print (if any) found there and see if the same unknown man made both. Sooner or later the crook will be caught. The police will have all the places and dates when his fingerprints were found in front of them, and they will ask him if he has anything to say about previous offences. If he is wise, he will own up. (*See Chapter III.*)

It is the hope of every investigating detective that he will find the fingerprints of the crook at the scene of the crime. Sometimes this is a tedious job and calls for a lot of elimination work.

Imagine that the safe in the office of a big factory has been broken open and the week's wages stolen.

The detectives will find fingerprints: the trouble is they will find far too many! Just consider how many people may have touched the safe in quite an innocent way and left their marks behind. The office boy, the cashier, the secretary, the managing director, casual visitors among them. Every print discovered has to be identified, and the detective in charge usually invites everybody with access to the office to give a sample of his or her fingerprints. In this way the innocent prints will one by one be eliminated, and the remainder that cannot be accounted for will belong (the detective hopes!) to the thief.

Some people believe that once their fingerprints have been taken, they are kept on the files for ever. The police are far too busy to bother about innocent prints, which are promptly destroyed. Very often the owner will be invited to destroy them himself.

When premises have illegally been entered, the investigating detective tries to put himself in the place of the thief. With the fingerprint experts, he follows the route taken by the intruder and points out all places where fingerprints might have been left. Door handles aren't much use as a rule—too many people have used them—but window-sills, table edges, doorframes, walls and furniture must all be examined. A perfect print was once obtained from an electric light bulb. A thief had brought a piece of connecting flex with him so that he could move the light closer to a safe he wished to open.

He had, of course, to remove the bulb from the ceiling fitting first, and he forgot about his fingerprints.

I said earlier that there were three sorts of fingerprints. They are *plastic*, *visible* and *latent*, and each sort requires a different technique before the Fingerprint Department can identify them.

Plastic prints are really moulds of the fingertips such as are left on a candle in hot weather, on butter in cold weather and on such other substances as putty, not-quite-dry paint, and soap. These prints can usually be photographed successfully by letting a strong light fall on them from one side.

Visible prints are made by fingers that have been in contact with such things as paint, blood, ink or dust. They are often very disappointing because they are too smeared to give a print that shows the ridge marks clearly.

Latent prints are so called because they are invisible and need to be developed before they can be seen or photographed. They are made in quite a different way from the other two. Plastic prints are made in the same way as a pattern is stamped on butter, visible prints are the result of the finger acting as a rubber stamp, but latent prints are caused by the minute traces of sweat which is nearly always being discharged by a normal healthy person. Tiny sweat glands are situated between the ridges of the fingertips, and when the fingers are pressed, even lightly, on some object, they leave behind minute quantities of sweat

which follows the pattern of the grooves between the ridges.

These traces are usually invisible, but they can be made visible by various means. The most usual is a powder which is dusted with a very soft brush over the area to be examined. The powder sticks to the traces of sweat, and when the surplus powder is blown off, the finger pattern is revealed. For dark surfaces a light powder is used, and vice versa.

Ultra-violet light ("black light") is often used for revealing latent fingerprints. The whole of the suspected area is scanned with an ultra-violet lamp (working at 3650 Angstroms, in case you are well up in Light). The lamp will sometimes cause the fingerprints to glow, especially if the fingers have been in contact with oil (hair oil, maybe). Sometimes the prints will show as dull patches, while the background glows. This happens on painted surfaces and certain wall-papers, as well as on furniture polished with wax-polishes. The dull patches are marked, then dusted with powder.

Very often prints occur on multi-coloured surfaces which make the prints very difficult to photograph, as the surfaces have both dark and light spots. The ultra-violet lamp goes into action again. The prints are dusted with, usually, anthracene, a fine powder which is much brighter than the background, and the print can be clearly photographed, leaving the background so unexposed that it hardly shows up at all.

When important prints may have been left on

paper or even cloth, a different technique is adopted. The area is treated chemically with silver nitrate, iodine fumes, or ammonium sulphide, and often the prints become clear enough to photograph.

In the next chapter you will read of cases in which the science of fingerprinting has led the detectives to the guilty parties. At the end are a few experiments in fingerprinting which you can carry out for yourself.

But again that word of warning. If you ever come across a crime, *please touch nothing* and leave the work to the experts. By trying to help, you may be helping a crook to escape.

# *Chapter Five*

## FINGERPRINTING IN ACTION

I HAVE mentioned that the science of fingerprints is less than a hundred years old; but for hundreds of years earlier men had noticed the complicated pattern on fingertips, and had wondered about their purpose.

There is some evidence that the Chinese used thumbprints instead of signatures two thousand years ago, but this was probably something in the nature of a ritual, and it is doubtful if they realized that every thumb left a different pattern.

The earliest case of a print being used as evidence comes from ancient Rome, where the mark of a bloodstained hand on a wall was quoted in evidence at a murder trial, but fingerprints were not regarded scientifically as evidence until Sir William Herschel, when a British Official in India, started to use them to identify Indians in 1858.

Scotland Yard started its collection of prints in July of 1901, the authorities being quite satisfied that no two people had the same finger patterns. Since that time thousands of criminals all over

the world have been identified by their fingerprints. For centuries before that the authorities had to rely on somebody recognizing the crooks, and that, as you know, is a very uncertain method. How often have you thought you saw someone you knew, on the street perhaps, only to learn later that your friend was miles from the spot? If you can make that mistake, you will realize how easy it is to make a mistake over a stranger whom perhaps you saw only once in a poor light. In the history of the world hundreds of thousands of innocent people must have been convicted because somebody quite honestly mistook them for crooks. It is rather a terrible thought.

About seventy years ago a French criminologist, Alphonse Bertillon, invented a system of identifying criminals by taking a number of measurements. He pointed out that no two people were likely to resemble each other in every physical respect: arms, legs, fingers, circumference of head (among many other points) must vary from individual to individual. Many countries adopted Bertillon's system, and it was certainly an improvement on the previous haphazard method of trying to remember. This system was limited in its use, because, of course, it couldn't operate until the criminal was caught. Once he had been arrested, his measurements were sent to headquarters to see if he had been in trouble before.

Although the police used very accurate instruments for measuring, the results themselves were

not always accurate because they depended on human observers who might be tired or careless, or even convinced they had the man they wanted and so made the measurements to agree with the aid of a little imagination.

In the year 1903, the superiority of fingerprinting over the Bertillon system was proved in quite an amazing way. It happened in America in Leavenworth Penitentiary, where a Negro named Will West was sentenced to a long term of imprisonment. As a matter of routine his Bertillon measurements were taken, and the prison officer who was writing them down exclaimed: "You've been here before, I remember the figures."

Will West was quite emphatic that he had never been in Leavenworth before.

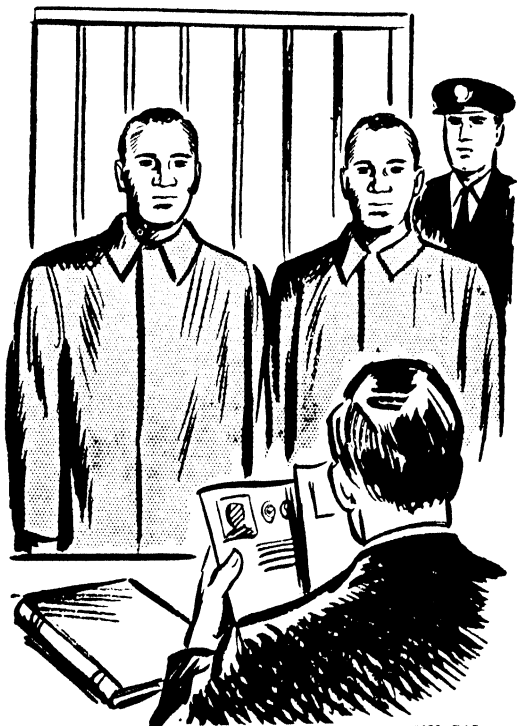
"But we have got your card filed away," the officer persisted. "Look here!" he went to the file and took out a card made out in the name of William West. There was a photograph on the card which West agreed was his: the officer checked the measurements on the card with those he had just recorded. "Well?" he asked.

"I never been here before," West maintained.

The officer turned the card over to find out the dates on which West had entered and left the prison. To his amazement he read that William West was still in prison: he was, in fact, serving a life sentence! It looked as though Will West was in two places at once!

The officer lost no time in sending for the Chief

Officer, who in turn sent down to the cells for the man serving a life sentence. When he was brought in, the officer gasped with astonishment, for here stood in front of him two Will Wests, alike as two peas, even to their Bertillon measurements. Nobody could tell which was which, although they were unrelated. Then one of the prison staff suggested taking the men's fingerprints. They were taken and compared: they were quite different.



For here in front of him stood two Will Wests—

You remember the case of Harry Lewis in Chapter I? Lewis was caught and identified by his fingerprints. When he killed Mr. Michaelson, he already had a criminal record, so his prints were filed away at Scotland Yard. The metal chair with which Mr. Michaelson had been struck was examined by the Fingerprint Department where latent prints were developed quite clearly. You can well imagine that Lewis was in a state of panic at the time, and so would be perspiring freely. Perspiration from his fingertips left a clear pattern on the tubular frame of the chair.

Recently I was investigating the case of a very brutal murder in Vancouver, Washington, U.S.A. A young nurse had been kidnapped late one night on her way home from hospital by two men in a car. Some days later her body was found miles away on a mudbank in a river. Nobody could recognize the two men, but while they were struggling with the nurse, a half-empty beer bottle rolled out of the car. It was handed to the police who found fingerprints on it. The prints were photographed and sent to the Fingerprint Department of the Federal Bureau of Investigation. Word soon came back to the Vancouver police that the fingerprints belonged to Utah Wilson, a man of twenty-two who had been convicted of burglary. The detectives hurried round to his house, only to find he had disappeared. So had his twenty-six-year-old brother, Turman Wilson, who had a conviction for brutal assault.



A half-empty beer bottle rolled out of the car

The brothers were traced to Sacramento, California, four hundred miles away. They were driving a car which had been bought in a false name and Turman was carrying a gun. The fingerprint on the bottle was the only direct evidence against the brothers, but the jury found them guilty and they were executed after their appeals had failed.

Here are two cases from the past which the science of fingerprinting could have solved, but which must always remain mysteries.

In the year 1866, the housekeeper at No. 2 Cannon Street, in the City of London, was found murdered in the hall: beside her was a heavy crowbar with which the crime had obviously been committed. The City detectives traced a man who admitted to having blackmailed the housekeeper, and witnesses came forward to swear that they had seen this man leave the door of No. 2



The brothers were traced to Sacramento

on the evening of the murder. But when the case was tried at the Old Bailey, the defence called several witnesses from Eton, where the prisoner lived, to swear he had been in the town that night. The jury decided the case had not been proved and found him not guilty. But on that heavy crowbar were undoubtedly fingerprints which would have proved the accused guilty, if indeed he was the murderer. Only, in 1866, the science of fingerprinting was unknown.

A much more famous case was heard in Glasgow in 1909. Fingerprinting was by then in full use, but very strangely no fingerprint evidence was offered.

It was a case of murder. The victim was Mary Gilchrist, a maiden lady of eighty-three. Miss Gilchrist's maid had gone to a shop a few yards

away at seven o'clock in the evening, and when she returned a man with his head down passed her in the hall. She found her mistress dying with terrible head injuries. Furniture had been disarranged and one small brooch was missing, though valuable jewellery had been left. A man named Oscar Slater was suspected. He came back voluntarily from America to stand his trial, and the maid now claimed she could identify him as "the man in the hall". Slater was found guilty, and sentenced to death. He was reprieved and his sentence commuted to life imprisonment. Having been of good behaviour, he was released in 1927, and immediately set about proving his innocence. It needed a special Act of Parliament for his appeal to be heard, and in 1928 his conviction was set aside. He was awarded £6,000 for his eighteen years in prison.

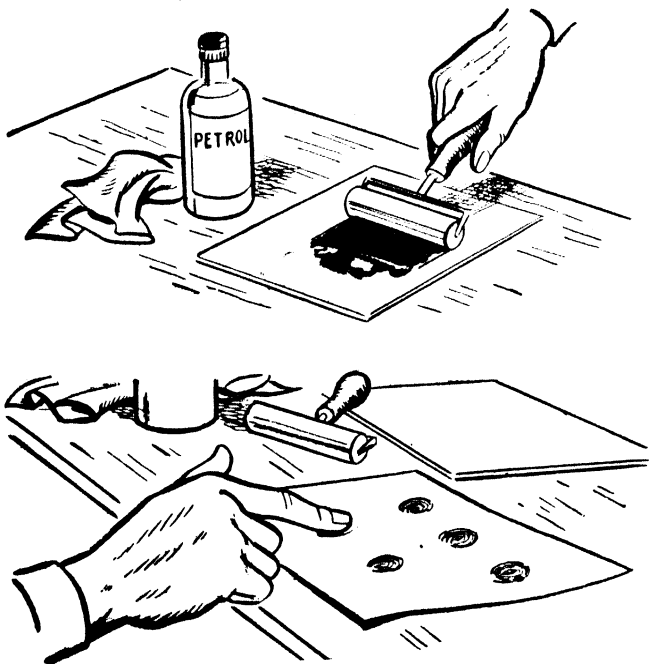
As I told you, no fingerprint evidence was offered, though surely there must have been fingerprints on the furniture in the house. They might well have settled the case beyond doubt at the time of the murder.

You would probably like to carry out a few experiments in taking and identifying fingerprints.

Some of these can be done very simply, and the first is to make you familiar with finger patterns—your own for choice! Get a little ink from your local printer and spread it thinly and evenly on a small sheet of glass. The best way of spreading is

to roll it with a rubber roller such as is used for squeegeeing photographic prints, but a thin-bladed knife will do. Now clean your fingertips with petrol or a cleaning fluid, and dry them on a clean rag. Roll each finger in turn on the inked glass, then roll them on a sheet of clean, stiff, white paper. You should be able to make five clear impressions for each hand. Wash your hands now, or you'll leave very-far-from-latent fingerprints on doors, furniture and towels!

Examine the prints you have made and see if you can classify them according to the illustrations



Taking fingerprints

on page 43. Notice the ridges with their "islands", forks and junctions. At least two fingers will have identical types, but when you study the details you will see that they are not exactly the same.

Go round a room which you use frequently and examine smooth surfaces for latent prints. If you look at the surfaces from all angles, you will find dull patches on the polish which are probably prints. If you breathe hard on these patches, you may be able to see very faint ridge-marks. Get a soft paint brush and gently brush the dull patches with a light powder (talcum will do). Blow the surplus powder off, and, if you're lucky, enough will stick to reveal the fingerprint. If you want to make a good job of the investigation, take a photograph of the print. In a later chapter, I will tell you more about using your camera. Now fetch in the paper bearing your ink impressions and see if you can identify any of the prints on the furniture as your own. You will need a



Finding fingerprints

magnifying glass. Try to find at least ten points of agreement.

If you can persuade your family to co-operate, you may be able to identify several prints.

But clear up the mess each time, please!

# Chapter Six

## SMUGGLING AND DRUGS

**S**MUGGLING, which is the illegal import or export of goods with intent to defraud the revenue, is an offence almost as old as history.

Since classical times rulers and governments have levied taxes on goods brought into their countries as a means of raising money, and men have always been found willing to risk liberty and life in order to make a profit.

In the eighteenth century smuggling was regarded as almost respectable in Sussex, and a story is told of how a Sussex parson preached for three hours one Sunday morning. He knew that two Excisemen were in his congregation waiting to question him and his parishioners. At last the Excisemen could stand it no longer: they went out and rode away. The parson got down from his pulpit—under which illicit kegs of French brandy were hidden!

Very few attempts are made to-day to smuggle wines and spirits, but there have recently been many bids to carry smaller cargoes of great value such as jewels and drugs.

A few years ago a large liner was boarded and searched in Liverpool Docks. The Customs authorities found some 30,000 pairs of nylons which members of the crew were trying to smuggle through and sell at a large profit without paying duty. I happened to be a passenger on the ship, though I was quite ignorant of the attempt!

Air travel gives would-be smugglers another means of bringing contraband into the country. Quite recently a French artist was searched at London Airport where the Customs officers found on him diamonds which he was trying to smuggle out of England. The artist was only a go-between, but, of course, he knew he was committing an illegal act. He had been instructed to wear a corduroy cap and wait at Piccadilly Underground Station. An elderly stranger approached him and gave him two packets which contained the diamonds. He was told he would be paid 30,000 francs when he delivered them in Paris. Instead he was fined £10,000 with an alternative of a year in prison. Two weeks later a Belgian was fined £50 for smuggling nearly four thousand watches into England. He had concealed them in the luggage boot of his car. The man had a fine record of war service, which probably saved him from heavier penalty, but, of course, the watches were confiscated.

Most smuggling is of a very minor nature, carried out by individuals who think it rather smart to cheat the Customs, but sometimes inter-

national rings of crooks attempt to operate on a large scale.

During the summer of 1954, the American authorities in Germany were instrumental in breaking up such a ring with the help of the German and French police. The activities of this ring are said to have covered the illegal import and export of goods worth a million pounds a month. One of the first victims of the swoop was a motorist who was about to cross the Swiss-German frontier. He was caught with currency, jewellery, cigarettes and gold valued at £20,000 in his car.

How the American authorities got wind of the ring is still a secret, but when Customs officials are dealing with individual travellers they use psychology just as the police do. They get to know, almost by instinct, when a man or woman is carrying contraband.

Some few years ago a woman crossed the Channel by sea from France to England. She was nursing a young baby and she seemed particularly anxious that it should not catch cold, for she kept a shawl wrapped round its face. She had actually just completed a very easy examination at the Customs shed when the baby barked! It was no baby at all, but a small terrier. In order to keep rabies out of England all dogs brought in have to be placed in quarantine for several weeks. The woman did not wish to be parted from her pet for so long.

Closely associated with smuggling is the dreadful



The baby barks

traffic in narcotic drugs. It has to be, for the plants from which such drugs are prepared are not grown in England, and, of course, their import, except for medical purposes, is illegal.

Unfortunately a very small quantity of drugs can do a great deal of harm, and can easily be concealed, though the police and Customs officers at all sea- and air-ports are particularly vigilant. It is safe to say that very few large consignments of illicit drugs reach England to-day, though seamen very often attempt to bring ashore packets which they will be able to sell at a large profit.

The Port of London Authority has its own police force, and this force has a "black museum" where many of the exhibits relate to drug smuggling. I

have seen there what appears to be an ordinary cotton vest, but when it is turned inside out it reveals eighteen neatly sewn pockets which were used to smuggle through packets of marihuana, the drug that is used in "reefer" cigarettes. I said the vest was used to smuggle the drug through, but it didn't succeed. The seaman wearing it attracted the attention of the Dock Police in some way: he was stopped and searched.

Another ingenious method of passing opium through the Dock gates succeeded—for a time. An old man with a hand-cart was allowed to go round the Docks collecting odd pieces of wood for firewood. He was given a pass and his journeys were quite legal. A particularly observant constable noticed that each time he passed through the Dock gates he was carrying in his load one particular piece of wood, a sawn-off portion of thick plank. The constable kept watch and saw that the man took this one piece back with him into the Docks. He said nothing but waited until the man returned. Then he stopped and confiscated the mysterious piece of plank. It was examined by detectives who found that a large knot in the plank was loose. They prised it out and found it had been cut short to leave a little hollow about half-an-inch in diameter and half-an-inch deep. In this was a small plug of opium. He had been meeting a seaman beside one of the ships and carrying out a tiny plug of opium each journey he made. Outside the Docks he was met by an-



Then he stopped him and confiscated the mysterious plank of wood

other seaman who sold the opium to a Chinese restaurant keeper.

There is very little opium smoking in London's East End to-day, partly on account of the vigilance of the police and partly because the Chinese population has almost vanished since the war. Pennyfields, where the largest Chinese colony lived, was almost completely destroyed by the blitz.

Believe me, there was nothing romantic about the opium dens of Limehouse. Mostly they were squalid attics, not luxurious apartments furnished with silken cushions! Opium smokers don't bother about their surroundings or even their personal appearance. Most often you would find the bare boards covered only with sacks, while instead of a

glamorous slant-eyed maiden, a slovenly old Chinaman shuffled round to his guests, dropping a little ball of opium prepared for smoking into each pipe.

Thirty-two or three years ago the drug traffic in London was a serious menace. There was a great demand for cocaine and its derivatives, and supplies were getting through from the East. The most successful dope trader was a Negro named Eddie Manning who ruined hundreds of lives with his drugs. The victims perhaps tried dope for a new thrill, and soon became addicts, and once in its power they would lie, cheat and steal to gain fresh supplies. Manning would use these unfortunate people to sell drugs for him to other victims: he was too cunning to carry them himself. He was caught finally and died in prison, but not before he had done incalculable harm, for dope destroys all moral sense and turns decent men and women into pitiful crooks.

Even more sinister than Manning was Miyakawa, the Jap, though he never really got a chance to put his plans into operation. He was arrested with 500 lbs. of muriate of morphine in his possession, enough for thousands of "shots".

Manning had worked for his own personal profit: Miyakawa was the agent of a huge combine backed, it was said, by the then Japanese Government. It was believed in many quarters that there was a gigantic plot to spread the drug-taking habit in England and so weaken the country's power to wage war. The idea is not so fantastic

as it may seem: the Japanese tried similar tactics in China before World War II, and there is no doubt at all the Japanese had been planning the conquest of the East, and perhaps of the world, for many years.

During the last few years there has been a great increase in the habit of smoking dried hemp, particularly in the United States. When prepared for smoking this is known in the East as hashish, and in the New World as marihuana. A variety of hemp grows in Mexico, and it is easy to smuggle it over the border into the U.S. owing to the desolate nature of much of the country. This drug has various effects on its victims and fills them with both strange hallucinations and unusual courage, so that they indulge in deeds of violence which would normally be quite foreign to their nature. Since it is light in weight and can be packed flat, attempts are often made to smuggle it into this country. When it is made up into "reefer" cigarettes, they may escape the notice of the Customs officers by packing them into ordinary cigarette boxes.

In June 1954, the police seized a consignment of hemp in London which could have been sold for a thousand pounds and was enough to make nearly 10,000 reefers. It was brought to England in a ship from West Africa, wrapped in waterproof material, and thrown overboard when the ship docked in the Pool of London. This had been arranged beforehand, and men were ready with a

small boat to row out and fetch it. The police got to learn of this, and managed to recover most of the hemp as well as to arrest the man and woman who had organized the attempt to smuggle the hemp in.

Police officers, especially those who work in dock areas, are trained to recognize the various forms in which dangerous drugs appear. It is safe to say that very little is successfully smuggled through, because drug takers sooner or later give themselves away by their behaviour.

# *Chapter Seven*

## FORGERY AND FRAUD

**T**HE law describes forgery as the making of a false document (or writing) in order that it may be used as genuine.

If you read about a case of forgery in the paper, you will probably find that someone was charged with “forging and uttering”. The “uttering” part just means that the offender has tried to make use of the forgery for his own advantage.

So you will realize that forgery can mean much more than just imitating somebody else’s signature. I remember one very clever forgery in which the only part of a document that wasn’t forged was the signature!

It happened this way: a band of crooks learnt that a wealthy man had certain valuable bonds and shares in the strongroom of a bank in Surrey. They knew it would be far too risky to break into the bank, even if they could find the necessary tools, so they hit on a much simpler way in which the bank would just hand over the documents to them.

They managed to steal a letter written by their intended victim. This was just an ordinary little

note to a friend but, of course, it had a signature on the bottom. The whole letter was written in ink.

The crooks first covered up the signature, then treated the letter with bleaching chemicals so that all the rest of the writing disappeared. They now had a piece of notepaper blank except for the signature.

This notepaper they put into a typewriter and typed on it a letter instructing the bank to hand over the documents to the bearer. Since it had at the bottom the written signature of the owner, it appeared to be a straightforward order to the bank. But the bank manager wasn't quite satisfied, and made some excuse for the crook to call again the next day. He kept the letter and handed it to the police for inquiries. The police passed the letter on to the laboratory, where it was examined as a matter of routine under ultra-violet light.

The fraud was immediately revealed. Between the lines of typing appeared the original words that had been written in ink and erased. The ink had caused certain chemical changes in the paper, and though the bleach had removed the colour of the ink, it couldn't restore the paper. When the ultra-violet light was turned on, the unaffected paper glowed light blue, while the erased letter glowed white.

This proved to the police that the order to hand over the securities was a forgery, but the letter could tell them something more. Like fingerprints, no two typewriters are exactly the same.



The fraud was immediately revealed

Under a strong magnifying glass it can be seen that many letters are a fraction out of alignment, and by careful measurement it is possible to prove that a certain letter was written by a certain typewriter.

The police not only arrested the crook who had taken the letter to the bank but his accomplices, and when they were tried it was demonstrated that the typing had been done on a typewriter in their possession. All the men were convicted and sent to prison.

The most common form of forgery is signing a cheque with an imitation of somebody else's signature. Bank officials are very clever at detecting forged signatures, and it is interesting to note that nobody signs his or her name in exactly the same way twice running. If two signatures are found *exactly* the same in every respect, it is pretty safe to assume that one is a forgery—probably it

has been traced lightly in pencil and then inked in. It isn't hard for an expert to tell the forgery, even without the original. A genuine signature flows smoothly and only shows breaks at normal places, whereas the forged signature shows places where the pen has halted every time the forger has stopped to check up with the original.

Fraudulent alterations to wills and other documents can generally be detected by a difference in the inks, as well as by traces of writing that has been erased. All the writing may look the same colour, but the ink of the original and the ink of the forged words will glow with different hues under the ultra-violet lamp.

Once a document has been folded, it is quite easy to tell if writing has been added later. The ink always runs slightly along the lines of a crease, if it is written after the crease has been made. The act of creasing breaks some of the fibres of the paper.

Sometimes the paper itself affords valuable evidence. Most paper is watermarked, and the manufacturers can tell the dates between which that watermark was used.

Several years ago the age of a certain letter was an important point in a law-suit. One side claimed that this letter had been written in 1780. It was on blue paper. Experts on the other side easily refuted the claim, for blue paper was not manufactured until about 1790. At that time paper-making was a home industry, and was manu-

factured by hand from pulped rags which had first been bleached. Usually the washtub was used for kneading the pulp. A paper-maker found one day to his horror that his pulp had turned a delicate shade of blue! The explanation was that his wife had left the blue-bag in the tub! The maker was afraid the blue paper would be refused, but the stationer to whom he sold his supplies was very pleased with it. Blue paper became instantly popular and the "inventor" made a fortune.

A forgery need not be handwriting. It is equally forgery to engrave a plate and print bank notes from it. This is a very difficult way of "making" money, and only once have notes been made that would stand up to expert scrutiny. The forger in this case was the Nazi leader, Himmler. During the war he caused plates to be made resembling those of English £5 notes. They were to be used for circulation in neutral countries, and for distributing secretly in England in order to cause economic chaos. The forgeries were perfect, and he is said to have manufactured £500,000,000 worth. Fortunately the war ended before they could be put into circulation, and some Dutch engravers who had been forced to take part in the forgeries escaped and reported what had been done. Most of the notes were discovered and destroyed, but there were still some £10,000,000-worth unaccounted for.\* To make sure, the Bank of England withdrew the issue which had been copied and redesigned the £5 notes.

\* Most of these were discovered in 1959 and destroyed.

The strangest case of home-made money I have come across is a pound note made entirely by hand. The forger was an artist who drew every line with a pen. Examine a pound note and see how many lines there are. It was estimated that each hand-made note took him a fortnight to complete! When you come to think of it, that wasn't very good pay for two weeks' work, and nobody quite knows why he did it.

Forging coins is rather easier, but with the present low purchasing power of money, it isn't worth the risk. Before the war the metal from which the tops of soda-water syphons were made was just right for the purpose. It was of the same appearance as silver coins (they aren't silver now) and it had a low melting point. A century and a half ago, when gold coins were in circulation, a popular practice among the dishonest was "sweating" sovereigns and guineas. New gold coins were placed in a bag and shaken until quite a lot of the metal had rubbed off as dust. The dust was collected, melted and poured into a mould, leaving the original coins still thick enough to pass as currency. This investment yielded ten per cent. "interest". At one time it was punishable by death.

Forgery and handwriting are often associated, and the question of handwriting arises in other cases as well. Poison-pen letters, for example. You have heard of such cases where the lives of innocent people have been made wretched by un-

signed letters and postcards alleging all sorts of offences against them.

Is it possible to tell who wrote the letter?

Usually it is, even though two pieces of writing may look totally different to the untrained eye. The expert looks for minute points of similarity which are difficult to conceal because they are something to do with mental make-up. For this reason you can't completely disguise your handwriting, even if you slope the letters the opposite way from usual, or hold the pen in the other hand.

The little points I mean are the ways "t's" are crossed and "i's" dotted, or "b's" and "j's" looped. The illustrations opposite will show exactly what I mean. They are taken from a real case. This is the story.

An old couple were sitting in their living-room when they heard something fall on the front door mat. They found a note telling them a neighbour had fallen in her house and blocked the front door and would they come and help?

It must have seemed rather odd, that whoever delivered the note did not knock and tell them personally. But they didn't stop to think and dashed out. They found the neighbour on her feet and in perfect health, but when they got home, they found their life savings had been stolen from under their bed.

Of course, they told the police, and it wasn't long before a woman came under suspicion. Suspicion is one thing, and convincing a jury quite

Mrs Jones

Mrs Jones

Mrs Jones

M m m J J J

t r t s s s o o o

n n n e e e

Minute points of similarity in disguised handwriting

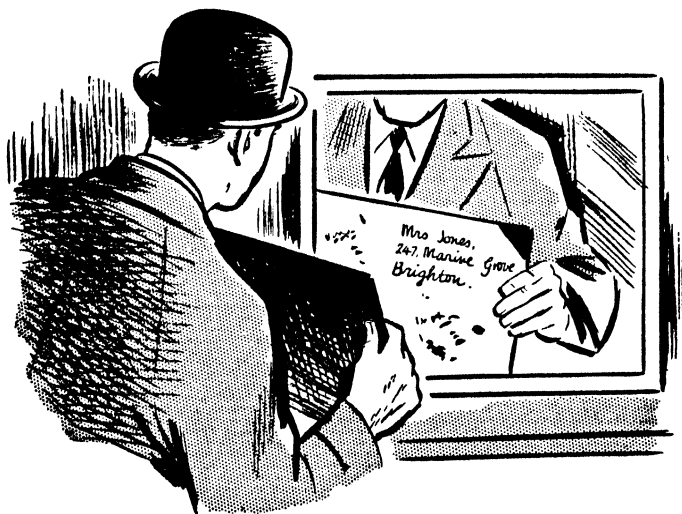
another, so the detectives looked about for proof. They invited the woman to the police station and asked her to write out a copy of the note which they dictated. This new note didn't *look* like the original. The detectives also found a washing list which the suspect had written out, and the writing on this was quite different from either of the other two.

All three pieces of writing were sent to the Home Office Laboratory whose experts found several

points of similarity between the three. So many that it was almost certain the same person had written all three. The jury thought so, and the woman was convicted.

Some people claim to be able to tell character from handwriting but the Home Office experts never attempt to use such theories as evidence.

Occasionally blotting-paper has given a criminal away, and I remember one case where a detective found a message on a hotel blotting-pad which led him to the hide-out of a murderer. The wanted man had stayed at the hotel and written a letter booking a room at Brighton. He had blotted the envelope while it was still quite wet, and when the



When the pad was held to a mirror the address could be read easily

pad was held to a mirror, the address could be read quite easily.

Occasionally a blank writing-pad can be made to reveal a message, especially if the message was written on the sheet above (that has, of course, been detached) in pencil or ball-point pen. A faint impression has been left on the sheet underneath, and it can sometimes be photographed, if it is very strongly illuminated by a light playing on it from a sharp angle. Try for yourself. Get a writing-pad that has been used and examine it in a dimly-lighted room with an electric torch. Hold the torch low down so that its beam makes an angle with the paper of about twenty degrees. The light of the torch will not be sufficient for photography, for which you will need a photo-flood lamp.

The early morning or late evening sun has more than once revealed signs of a struggle on grass or earth which could not be seen when it was overhead. When the rays strike the spot slantingly they show up slight impressions which are missed when the sun is nearly overhead.

# *Chapter Eight*

## SCIENCE AND POISON

**H**ow many stories have you read in which the victim was killed by a subtle, secret poison that left no trace?

Actually this can never happen, and although different poisons create different symptoms, their effects are basically simple: they act on the tissues of the body by over-stimulating or by depressing their functions.

You may be surprised to learn that there is no legal definition of poison, and the offences with which unlawful users of poison are charged is with "administering, or causing to be administered, any poison, or other destructive thing with intent to murder, or with the intention of stupefying or overpowering an individual so that any indictable offence may be committed."

From which you will see that it is "poisoning" to overpower someone with chloroform in order to rob him.

It is only during the last hundred years that the science of toxicology, as the study of poisons is called, has made any real progress. Before that

time there were indeed secret poisons, and the doctors were quite unable to determine the cause of death.

Arsenic, to-day one of the easiest of poisons to detect, was for centuries a popular medium for murderers. It was often mistaken for certain diseases, and many people must have been buried as having died from natural causes when in fact they were murdered.

I am often asked whether I believe many people are poisoned to-day, the murderers escaping justice with a death certificate of "natural causes" from the doctor.

The answer is no. Doctors receive special training in matters relating to murder and attempted murder, and they are more capable than most people of exercising common sense. When a patient dies unexpectedly they do not immediately sign a death certificate, but notify the Coroner, who will order a post-mortem examination to be made. Often enough the examination will reveal that death was, in fact, due to some unsuspected disease, but if it was not, somebody is very soon going to be in trouble!

Of course poisoners do sometimes get away with it, but their success makes them over-confident and they try again.

Nearly a hundred years ago a nurse stood in the dock in the Old Bailey charged with attempting to murder a patient by administering sulphuric acid. Fortunately for the patient she spat the "medicine"

out and it burnt holes in the bedclothes. To the surprise of everybody, the nurse was found not guilty, but as she stepped from the dock she was re-arrested by a detective from Lincoln on seven separate charges of murder.

Nurse Wilson had made a practice of nursing old ladies with gout, and so influencing them that they made wills in her favour. All the patients died! There were rumours in Lincoln, but nothing was done until the Lincoln police learnt that she had been charged with attempted poisoning in London. Then they interviewed the doctors who had been attending her patients. As a result the bodies were exhumed, and although the science of toxicology was still in its infancy, enough evidence was collected to find her guilty when she was tried a second time. She paid the full penalty for her crimes.

In 1809 a "witch" was hanged in Yorkshire for poisoning a woman whom she had swindled of money. She had induced her victim to mix powders with her food, and there is little doubt that those powders contained sublimate of mercury.

There were no scientific tests for detecting poison in the human body in those days, but evidence that a healthy cat had eaten some of the powdered food and had died soon after was strong evidence against the accused woman.

In 1881, when toxicology was becoming an established science, a young doctor, George Henry Lamson, was charged with the murder of his schoolboy brother-in-law by administering poison. Lamson

stood to inherit a considerable sum of money by the death of the boy who was a cripple. You can understand that it was not too difficult for a doctor to prescribe "medicine" in the case, and when Lamson visited him at school, he induced him to swallow a pill. Nor was it difficult for a doctor to obtain poison, and it was proved that Lamson had bought aconitine.

The trial centred on whether it was possible to detect vegetable poisons in the body after death, and medical evidence was accepted that made the path of the poisoner very much harder for the future. Scientists, called to give evidence for the prosecution, described how they had made extracts from the dead boy's stomach and had injected these into mice, which had died. They had also injected aconitine into other mice which had died with the same symptoms.

To-day it is not necessary to use mice: accurate analytical tests in the laboratory can determine whether poison is present in human organs, and whether it is present in sufficient quantity to have caused death.

# Chapter Nine

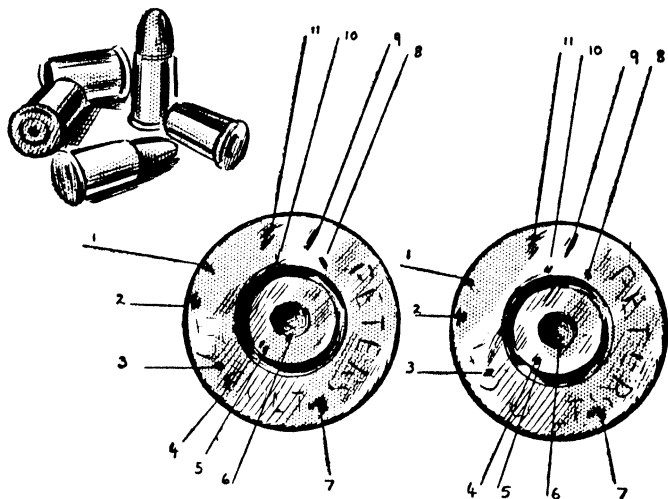
## THE SCIENCE OF BALLISTICS

**T**HE dictionary defines ballistics as the science of the motion of projectiles. It is derived from the Latin word *Ballista* which was a sort of great catapult for hurling stones against enemy fortifications—the earliest form of artillery.

For the police it has a rather different meaning, and it concerns guns, bullets and cartridges, from which valuable information about a crime can sometimes be obtained in the laboratory.

Did you know that guns left “fingerprints”? They do, and often these “fingerprints” are so definite that it is possible to tell with complete certainty that a given bullet was fired from a given gun. It is also possible to tell whether a certain cartridge-shell was fired from the gun.

To-day the barrels of nearly all fire-arms, except shot-guns, are rifled, that is, they contain grooves which ascend spirally from the breech to the muzzle in order to spin the bullet as it leaves and give it a more accurate flight. These grooves are cut by machinery, but even so it is not possible to make two exactly alike in all respects, and in addition

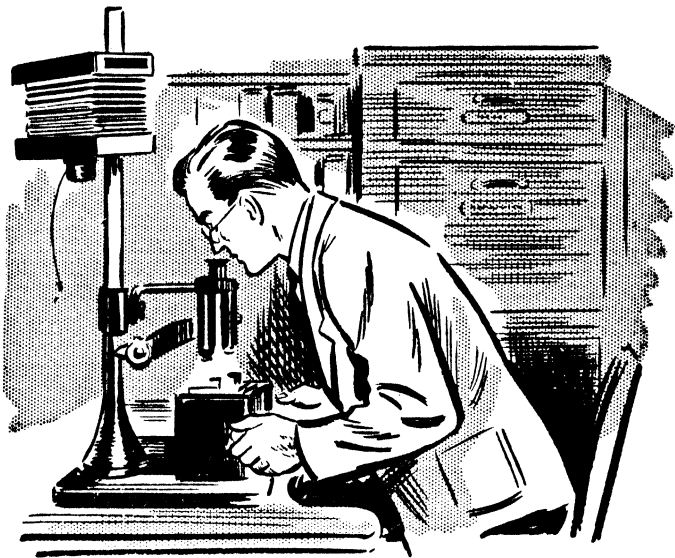


No two fired cartridge cases are alike unless they have been fired by the same gun

wear creates tiny irregularities. As the bullet is propelled along the barrel by the explosive charge, the marks of the grooves are etched on it. As a result, no two fired bullets are exactly alike *unless they have been fired from the same weapon.*

These facts enable the police to find out whether the bullet which has killed or wounded a victim of a crime was fired from the weapon found in the possession of a suspect. Of course they refer the case to the laboratory where a special microscope is available for the work.

The technique is as follows: the laboratory staff are handed the bullet recovered from the victim (or from nearby, if it has passed right through) together with the weapon from which they believe it was fired. The experts prepare a comparison bullet by firing a round from the suspected weapon. The



The microscope now comes into play

target is a bale of paper or cotton wool from which the bullet can be recovered undamaged. The microscope now comes into play. It is a low-powered instrument with twin platforms and twin eye-pieces. On one platform is placed the bullet recovered from the victim, and on the other the test bullet. The bullets are rotated until, if they were both fired from the same weapon, the etchings on them are identical. A photograph is now taken to show how the marks agree, and this will probably be produced in Court as evidence when the suspect is tried.

The cartridge-shell can be identified in two ways. Marks are made on the sides of the breech of the weapon, and a much more distinct mark is made on the base by the firing pin. Here again the com-

parison microscope will enable pictures to be taken showing the resemblance.

One of Scotland Yard's most famous murder cases in which the evidence of cartridges and bullets secured a conviction took place in 1927.

The victim was an Essex police-constable, P.C. Gutteridge, who was killed by two desperate gunmen in a country lane. He was found the next morning with four bullet wounds in his head, including one through each eye.

There is a superstition (which the murderers may well have believed) that a picture of the murderer is imprinted on the victim's eyes at the moment of death. This is a superstition and nothing more: there is no truth in it.

Beside the dead constable was his note-book, his pencil was in his hand and his whistle was hanging loose.

Scotland Yard was invited to assist in the case, and Chief Inspector James Berrett was detailed for the work. He found signs that a motor car had collided with the bank beside the road at the scene of the crime, and he learnt from his Essex colleagues that a car had been stolen from Billericay on the night of the crime. It seemed possible that there was some connection. Berrett attempted to reconstruct the crime in his own mind. Suppose the murderer or murderers had stolen the car. Suppose P.C. Gutteridge had stopped them. Why should he stop them? The Inspector made further inquiries and learnt that the car belonged to a doctor. That was

the answer: the local constable would be very familiar with the local doctor's car, and would be suspicious if he saw strangers driving it at night.

But what was the point of so brutal a murder? Surely no ordinary car thief would take such a desperate step?

Berrett knew of one or two car thieves who were ruthless, brutal men, but he had no evidence against any particular one, not even when the stolen car was found abandoned in London. But the car did yield some clues which were going to be useful later on. He found traces of mud on the side of the car which corresponded with the mud on the bank; he found blood-stains on the running-board; and inside he found a spent cartridge-shell. The cartridge was of an obsolete pattern last used before the 1914-1918 war.

By now Berrett had decided in his own mind that one of the murderers (if there had been more than one) was an ex-convict named Frederick Guy Browne, a man who specialized in car thefts and was known to be careless of life, his own and other people's. He had boasted he would die on the gallows. But suspicion is not evidence, and there were still no grounds for arresting Browne, even if he could be found.

By luck a car was involved in an accident with a van in Sheffield many weeks after the murder. The police decided to summon the driver of the car as being responsible for the accident, but they found the car had been stolen and the driver had given a



He had no time to draw one of his many guns

false address. Fortunately for justice there had been a passenger in the car, and he wrote to the Sheffield police that the man who had given him a lift had been responsible for a series of armed hold-ups and was probably responsible for the murder of P.C. Gutteridge also.

Berrett was, of course, informed, and he now had an excuse for arresting Browne, since he was wanted for car theft and for giving a false address after an accident.

At last Browne was traced to Battersea where he was running a garage business. Detectives waited until he was absent from the garage, then made plans to surprise him when he came back. Late in the evening, four months after the murder, Browne drove into the garage. Immediately, as he started

to alight, the detectives closed with him. He had no time to draw one of his many guns.

And among these guns was the one which had fired the bullets which killed P.C. Gutteridge. This was proved by the evidence of Mr. Robert Churchill, the famous gunsmith. At this time the Home Office Laboratories had not been established.

Browne was convicted and hanged, as was his confederate, Kennedy, another ex-convict. Kennedy had not actually fired any shots, but he had gone out with Browne to steal a car, he knew Browne was armed, and he did nothing to prevent the crime. Under the law he was equally guilty.

Some laboratories use a rather simpler method of comparing bullets. This is adopted in France, where the Sûreté detectives often have to work far from any technical help. Both crime bullet and comparison bullet are rolled in thinly spread printer's ink, then they are rolled across a sheet of clean paper. The two tracks are compared under a magnifying glass.

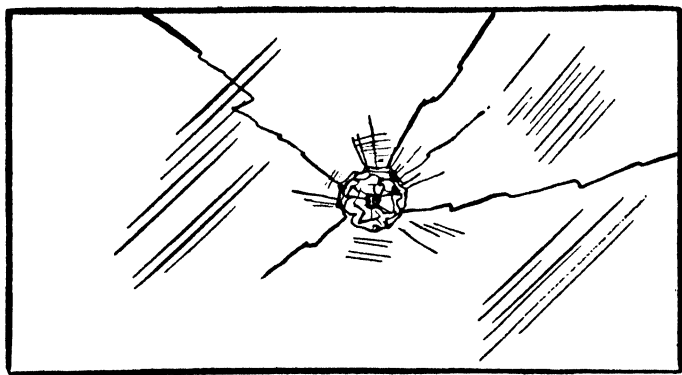
You can try this method for yourself, if you can find a handful of bullets on your rifle range. Instead of printer's ink, which is a thick paste, you can use the paint from a tube of artist's oil colour. This technique is useless if the bullets are badly flattened, as they will not then roll on the paper. See if you can identify also the cartridge shells by examining the marks made by the firing pin.

Ballistics experts and doctors between them can tell with considerable accuracy the distance from

which bullets were fired, and the angle from which the weapon was aimed. Outside fiction, detectives are seldom puzzled about whether a dead man has committed suicide or been murdered. The fact of placing a gun between the fingers of a murdered man does not always suggest suicide: indeed, it may have just the opposite effect.

Up to sixteen inches, the distance from which a bullet was fired into a human body can be accurately determined by the marks formed on the skin. When the muzzle of the weapon has touched, or nearly touched, the victim, there will be definite burning caused by the intense heat of the expanding gases from the explosion. A little further back "tattooing" will occur. This so-called tattooing is made by grains of unexploded powder being driven into the skin. Further back still there is quite a wide area round the wound, of tattooing and carbon. If there are no marks round the wound, it is extremely unlikely that the victim has committed suicide, even if the weapon is beside his hand.

Sometimes a shot has been fired through a closed window. Unless you are familiar with the appearance of glass through which a bullet has been fired, you may well think that it was fired from the side on which the glass was flaked away round the hole. Actually when a bullet strikes from short range, it makes a neat hole where it first hits, then flakes away the glass on the further side. Of course, a bullet fired from a considerable distance will break the window.



When a bullet strikes glass from short range, it makes a neat hole where it first hits, then flakes away the glass on the further side

Implements used for forcing open doors, windows and locks also leave “fingerprints”. Under the microscope even the sharpest chisel has an irregular edge, and looks more like a saw blade. These irregularities leave corresponding marks on wooden surfaces.

Housebreakers sometimes use a stiff piece of celluloid to force open the older types of “safety” door locks. The mechanism of the lock scratches marks on the celluloid, and these can be identified. Of course the celluloid is little use for evidence unless it is actually found on the suspect, or unless he has left his fingerprints on it.

One final word here: *Don't attempt to carry out experiments with fire-arms!*

# *Chapter Ten*

## CRIME AND THE CAMERA

FIFTY years ago one or two enterprising police forces possessed cameras as part of their official equipment: to-day nearly every force in the civilized world relies on photographic records and evidence.

As a matter of routine, photographs are taken of convicted persons before they start to serve their prison sentences, records are made of scenes of crimes and accidents, photographic exhibits are prepared to show fingerprints, bloodstains, bullet marks and even the victims of attack.

Every convicted criminal has a master card filed in the Criminal Records Office, and this card bears at least two photographs of him, one taken full face and one side face. When I visited police headquarters in Rochester, New York State, the officer in charge showed me a new technique (from the police point of view) for convicted persons. They were not only photographed in colour but with a stereo-camera. The pictures were used for showing to victims of crime who came in to identify suspects. So realistic did these photographs appear when seen

through the viewer, that I heard one woman exclaim: "Don't stare at me like that!"

Most big police forces have, in addition to the photographs on the master-cards, collections of portraits grouped according to the crimes. If, for example, someone comes in to complain that his gas meter has been emptied by a bogus inspector, he will be shown the photographs of all known criminals who pose as meter inspectors in the hope that he may recognize the one concerned.

It is, of course, necessary that all police photography should be of the highest quality. Many of the operators make photography their spare time hobby as well, and have won prizes in competitions. During the war the Photographic Department of the City of London Police made photographic records of bomb damage. You might not think this allowed much scope for artistry, but you would be wrong: many of these pictures are technically and artistically up to competition standard and are really beautiful, in spite of the grim subjects they portray.

Fingerprint photography is almost an art in itself, and sometimes it requires great ingenuity to secure a clear picture. When a latent print has been developed on a plain surface with powder the task is straightforward and needs only accurate focusing and exposure. But it is not so easy when the prints appear on dull, partly stained or on multi-coloured surfaces. In the latter case a fluorescent powder and ultra-violet light are used. Exposure for ultra-violet

light photography depends on the degree of fluorescence of the subject.

Sun-tan lamps do not operate at the best wavelength for photography, but they will cause many objects to fluoresce. If you have such a lamp, try the effects of it on various papers and inks. You may be able to distinguish between two white papers which look identical to the naked eye. You can also try the lamp on secret "inks". Write your messages on plain paper with lemon juice, saliva, milk or ammoniated tincture of quinine (cold cure), and let the writing dry thoroughly. Then examine the writing under the lamp. In some cases it will fluoresce more brilliantly than the paper, in others it will appear dull by contrast. Each type will require different exposure: visual brilliance is some guide, and the range usually lies between five seconds and two minutes.

Oils, paraffin and petrol fluoresce brilliantly. Sometimes it is possible to detect oil stains on a handkerchief, even when it has been washed after staining. The same applies to bloodstains which, however, do not fluoresce but appear as dark patches.

You can even tell the age of an egg by ultra-violet light. A new-laid egg glows rosy pink, while a stale egg shows patches of purple on the shell!

When secret inks are used for messages, they are usually developed by holding in front of a fire. The heat, of course, chars the writing, which shows up brown and remains permanently. Ultra-violet light

(unless it is turned on for a considerable period) causes no chemical change, and the writing disappears as soon as the light is switched off.

*Never use the sun-tan lamp without wearing the proper goggles, and do not allow friends to watch unless they have goggles on.*

While ultra-violet light is itself invisible (though all U.V. lamps also produce some rays of visible light), it causes many substances to glow visibly, and secret writing or stains can actually be seen while the lamp is on. Infra-red light is also invisible, and the objects it illuminates (if you can call it that) are also invisible to the human eye. Not to the camera. You probably know that clear photographs of very distant scenes, which are completely hidden by haze or even fog, can be taken on films or plates specially sensitized to record the infra-red rays.

As you can imagine, the police are not often interested in photographing distant landscapes through fog, but they often use infra-red photography for much closer work. It has been particularly successful in revealing writing that has been deliberately or accidentally concealed. Where ultra-violet light has failed to show what lies underneath, infra-red light has yielded a photograph that shows the writing through the covering agent.

Infra-red photography is beyond the scope of most amateurs, and requires special plates or films, and special filters.

If you have an urge to try infra-red photography, write to one of the well-known manufacturers of

films and plates, and ask if they have any of the size to fit your camera. If you tell them exactly what you want to photograph, they will give you all the details of exposure and filters.

I have told you never to interfere in cases of crime, but if you find yourself at the scene of a crime or an accident with your camera, you will do no harm if you take several pictures before anyone has time to move anything. (This applies specially to accidents, where someone may move one or both of the vehicles before the police arrive.)

Here are some do's and don'ts.

Don't go too near, so as to damage foot- or skid-marks with your feet. Don't move or touch anything, and don't let anybody else.

Do keep calm and pay as much attention to exposure and aperture as you would if your favourite uncle was posing on the back lawn.

Take several pictures from several different angles: if you have to photograph against the light, hold the camera as high as possible and point it down to avoid including the sky.

Do remember to wind the film on each time!

When the police arrive, tell the officer in charge what you have done and seen in as few words as possible.

Offer him your camera so that the police experts may themselves take out and develop the film.

Don't be disappointed if your pictures aren't as useful as you hoped!

Don't imagine that the camera can't tell lies! It

may not mean to, but its photographs can be very misleading. Suppose you are at the scene of a road accident where two cars have collided. It is quite obvious to you that one of the cars is on its wrong side of the road, but a carelessly taken picture may make it appear that the accident took place in the middle of the road. That is why I said earlier you should take several pictures. One at least should be taken down the length of the road showing not only the two vehicles, but the white line, if there is one.

Photography once caught a murderer by accident, though you are hardly likely to do that.

In the case I'm thinking of, an elderly woman was disturbed in her basement flat in Hammer-smith. She owned a lot of house property, and collected the rents herself. One morning a tradesman calling for orders could get no reply. The door was ajar and he pushed it open. He saw the woman partly covered with blankets on the floor. She was dead. The police were called and soon decided she had been robbed and murdered, but there were no obvious clues. As a matter of routine they asked all along the street whether anyone had seen a stranger leaving the flat at any time during that morning. One or two people remembered seeing a man and a woman near the door. They could give no description, but "they thought they would recognize them if they saw them".

It happened that a street photographer had been busy in the road that morning: the type of photographer you have seen dozens of times with a

35 mm. camera who often snaps you and then tries to persuade you to buy a print. The detectives found the photographer and had his films developed: he had taken literally hundreds of pictures.



Take several pictures from different angles

Transparencies were made from the films and the police invited all those who had seen the couple to attend at Scotland Yard. The transparencies were projected on to a big screen. When the large collection of transparencies was nearly finished, a picture of a young man and woman appeared on the screen. One of the audience recognized them.

It didn't take long for the Criminal Records Office to check this picture against their photographic

records, and they matched the man in the picture, for he had a criminal record.

The end of the story has nothing to do with photography, but it is worth repeating. Although the police knew the man they wanted, they couldn't find him. They circulated his description all over



One of the audience recognized them

England and reports came in of men who resembled him, but not one was the suspect. The detective inspector in charge had posted men near the scene of the crime on the off-chance that the wanted man was living nearby or might come back for some reason. Days passed without results; at last the inspector decided he would have to call his men off. It was late at night, blowing a gale, when he made his decision. As he was on his way he paused to

light his pipe. A bus went by. He looked up and saw the man he wanted sitting in the bus. It was a matter of seconds to hop on and arrest him.



It was a matter of seconds to hop on and arrest him

# Chapter Eleven

## MODERN AIDS TO CRIME DETECTION

A HUNDRED years ago the detection of criminals rested largely on information received from witnesses: other clues were there, just as they are to-day, but the means of interpreting them was lacking.

Other chapters deal with fingerprinting and laboratory work, but there must also be mentioned those modern inventions that make the work of the detectives more certain, among them the telegraph, telephone, teleprinter, radio, aircraft and motor cars. The last two mentioned are also often of advantage to the crooks as well as the police.

The first record of radio being used in criminal investigation occurred in the year 1910 when an American doctor, Hawley Harvey Crippen, who was working in partnership with an English dentist in London, was wanted for the murder of his wife. He had killed her with poison and buried her in the cellar of his house. Confident that he had escaped justice, Crippen, accompanied by a girl-friend, took the liner *Montrose* to Canada, intending to make his way thence to his native country.

In 1910 the larger ships had been equipped with radio telegraphy, and Chief Inspector Walter Dew of Scotland Yard, who was in charge of the case, was quick to take advantage of this new invention. As soon as the body had been found, Dew guessed that Crippen might make for America, and he caused a description of the missing man to be circulated to all ports, and to such ships at sea as were equipped with wireless. A reply came back from the captain of the *Montrose* that he had on board a couple, one of whom he believed to be Crippen, and the other a woman; though she was dressed as a boy and claimed to be the man's son. Further messages passed, and Dew was convinced that his man was on the *Montrose*. Fortunately it was a comparatively slow boat. Dew took a passage on the much faster *Laurentic* and reached Canada ahead of his quarry. He had time to arrange for the *Montrose* to be boarded by Canadian police and for Crippen and his companion to be arrested. This was done, and Dew was able to bring Crippen and his companion back to England to stand their trial. Crippen was found guilty and executed, his companion was found not guilty.

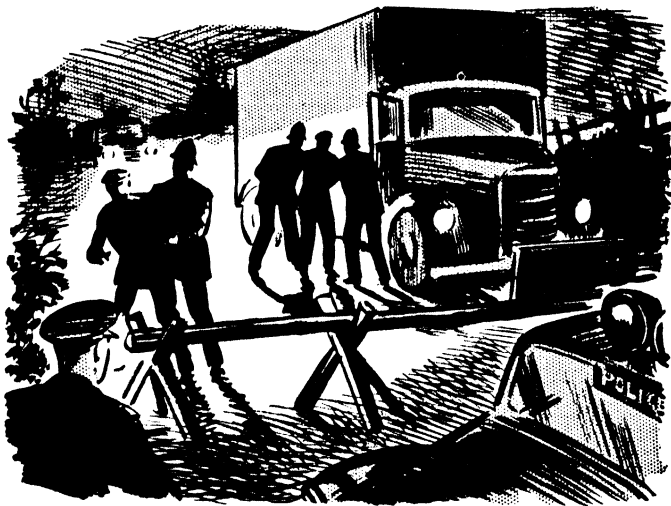
To-day police messages are flashed round the world—not only messages but photographs and fingerprints—and the crook crossing the Atlantic by plane may find the F.B.I. awaiting him at New York.

Most English police forces to-day are equipped with ultra-short wave radio for communication be-

tween headquarters and the patrol cars (and boats, where they are used). The latest systems enable car to speak to car as well as to headquarters. The Hertford Police were the first to be equipped with this system, and the choice was a particularly important one because that county has a particular problem in regard to lorry thefts. If you look at a map you will see that in Hertfordshire many of the main roads from the industrial Midlands and North pass through as they converge on London. Since the journey to London is now short, it is an ideal area for the lorry thieves, who can quickly reach London and disappear in its thousands of streets: they do not have the risk of being stopped that a long journey would give.

Usually two or three men working together plan these thefts: sometimes dishonest lorry drivers co-operate. The lorry, with a cargo, say, of whisky or cigarettes, or, as happened recently, radio sets, is followed from its loading point by the crooks in a private car. As it nears London, the driver will pull up for refreshment and leave his lorry while he goes into a roadside café for tea and perhaps a short sleep. This is the thieves' opportunity. They board the lorry and drive it to a side turning a mile or so away, down which they have their own lorry waiting. It is the work of a few minutes to remove the cargo to their own lorry which they drive to London, leaving the stolen one in the lane. By the time the rightful driver has discovered the theft and notified the police, the thieves are miles away.

I cannot tell you all the methods used by the police to catch up with lorry thieves, but radio plays a big part. Within a few minutes of the theft being reported, road blocks are established at strategic points, not only in Hertford, but in the Metro-



Road blocks are established and many thieves are caught redhanded

politan Police area, and many of the thieves are caught red-handed.

The same technique is applied to the burglars who raid large country houses, since in nearly every case the stolen property is taken to a "fence" in London.

Modern science has developed an "automatic detective" which has succeeded in catching many

warehouse thieves. And the thieves don't even know how they were caught!

The device consists of a series of concealed wires and light beams operating relays (such as are sometimes used for the automatic opening of doors). This idea is not new, and for years it has been used to ring an alarm bell, but the bell warns raiders as well as police. The new method silently rings up the police and plays a little record which announces that thieves have broken into the premises. Since the alarm is silent, except at police headquarters, and the thieves operate it at the beginning of their raid, the police are able to surround the premises and catch them at work.

Occasionally the English police use walkie-talkie apparatus, and this is particularly useful when a large party is searching a country district for a suspect, his victim or for clues. It can also be useful for controlling crowds when the man on the spot finds an urgent need for reinforcements. The Dutch police make much more use of the apparatus than we do in England, and in Amsterdam they have a further means of traffic control. The main road to the docks becomes very congested at times when the dock workers are going to work or leaving for home. If the street becomes completely blocked, the police on duty will walkie-talkie radio to headquarters where all the traffic lights in the road can be turned to green. This prevents any traffic from the side roads from entering, and the block is quickly cleared.



A walkie-talkie

In England the courts do not permit the use of the lie detector (polygraph, to give its correct name), but some American States allow it to be used for evidence. Properly operated, it is a useful aid to justice, but the man in charge must be a trained psychologist.

There is nothing magic about the lie detector: it is a piece of mechanism which records pulse rate, blood pressure and breathing rate. Instruments

which do this have been in use in hospitals for medical purposes for years. The theory of the machine for crime detection is that most people show some emotional reaction when questioned about a crime in which they have been concerned. This reaction produces certain physical symptoms, the most usual and obvious of which are increased pulse rate, increased blood pressure and slow or irregular breathing.

I spent some hours with the machine myself at the Chicago Police Laboratory, and the best way of explaining its operation is to tell you my own experience.

The man in charge had a quite soothing voice. Although he "had nothing on me", he explained he was going to treat me as though I were a suspect. I wondered how he could do this when I had a clear conscience, but I soon found out! First he explained the working of the apparatus to me, then he asked for my full co-operation. Without that, he said, the test would be useless: I could easily spoil the chart by coughing, or deliberately controlling my breathing rate. Then he strapped a tube round my arm and pumped it up so that I could just feel the pressure. This tube was electrically connected to an inkler (such as is used on a clockwork barograph) which marked variations on a moving chart. This would record both pulse rate and blood pressure. Then he fastened a large tube round my chest. This was similarly connected to an inkler to record my breathing. He started the chart moving.

"Now," he said as he produced a pack of ordinary playing cards, and picked out the first seven cards, "I want you to choose one of these cards. No, don't touch it: just make up your mind."

I chose the seven of diamonds, but, of course, did not tell him.

"All you have to do," he explained, "is to tell a simple lie. I shall hold up each card in turn and ask you, 'Is this the card you chose?' Each time you will say no."

This was easy, I thought, though I don't claim to be an expert liar!

We went through the cards one by one, and each time I answered his question with a determined no. At the end he studied the chart in silence for some minutes. Then he smiled and said "You chose the seven of diamonds. Have a look at the chart."

I leant over to look. Neither my pulse rate nor my blood pressure had altered, but my breathing—as soon as I had told the lie I quite unconsciously let out a deep breath in relief. The chart had faithfully recorded it.

We tried out several other tests, and I was quite unable to beat the machine. Imagine what my chart would have been like if I had had a guilty secret on my conscience!

The next day I had an opportunity of seeing the apparatus in action in real time. A Negro girl had been brought in charged with murder. She protested she had stabbed a man in self-defence and readily agreed to a test on the lie detector. The

operator explained the workings to her in exactly the same way as he had explained them to me. Then he started the chart moving and began his questions. Many of them had nothing to do with the charge, but vital queries were mixed up with quite commonplace remarks.

"Did they treat you kindly when you were arrested?"

"Did you have a good breakfast?"

"Did you carry a knife specially to kill this poor man?"

The answer to the last question was: "No, sir, I never. I always carries a knife for my work. I have to cut up vegetables in the restaurant kitchen where I works."

At long last the examination was finished. When the girl had been taken away, the operator carefully studied the chart and wrote out his report. "I believe her story that she acted in self-defence to be true," he wrote. "It would be very unsafe to proceed with a charge of murder in the absence of direct evidence."

Which was a very fair report. The charge was eventually reduced to one of manslaughter and the jury found her not guilty.

When the test took place, only the operator, the accused girl and the policewoman were in the room. How did I see and hear it all?

The American police make use of two other devices which we in England do not use: the microphone and the half-mirror: I was in a dimly lighted

room adjoining. There was a concealed microphone in the operating room and a tiny loud-speaker in mine. That accounts for hearing it. On the dividing wall was a mirror in which the girl could see her reflection. But this wasn't an ordinary mirror. Its back was very thinly silvered, and though the girl in the brightly lighted room could only see her reflection, I could see right through the mirror. (Of course, the wall had been cut away behind the mirror.)

Talking of microphones, American police cells are often wired with concealed microphones in the ceiling. A frequent practice is to put a "stoolie" in with the suspect. The stoolie pretends to be another crook and he boasts of his crimes: really he is in the pay of the police or perhaps a detective. The microphone is connected to earphones at police headquarters and also to a tape recorder. If the stoolie succeeds in getting his victim to talk, the listening police officer immediately starts the tape recorder and obtains a record of the conversation.

In America private detectives really do operate, and are employed for all sorts of investigations which would be the work of the regular police in England. One whom I met in Chattanooga, Tennessee, was frequently employed by large firms to investigate the honesty of prospective employees. He had a lie-detector in regular use when he interviewed the men to help him form an opinion of their character and past records.

He also had a most ingenious device for tracing

people who were reluctant to be interviewed. It consisted of nothing more than a peaked cap with a silver badge on which was engraved Special Delivery.

Wearing this cap and armed with an important-looking parcel and a receipt book, one of his men would go to the last-known address of the wanted person. "Mr. X in?" he would ask whoever answered the door. He would usually be given a curt no. "I've a special delivery parcel for him," the detective would say.

"Give it to me. I'll see he gets it."

"Lady, do you want to have me fired?" the detective would exclaim. "I have to deliver this parcel to him personally and get his receipt."

And very often, I was told, the ruse succeeds.

I suppose I ought to mention "third" degree. I can assure you that this isn't a regular practice among the American police, though I can't guarantee it never happens. According to films and novels, it consists of endless questioning while bright lights—and occasionally rubber truncheons—play on the suspect until he breaks down and confesses.

What does happen as a matter of routine is what is variously called the "show-down", "show-up" or "line-up". Americans, even the arrested persons, don't regard this as an illegal or unjust practice.

Here is the description of one I attended.

It took place in a hall resembling the lecture room of a college. At one end was a narrow platform illuminated by head and footlights so that those

standing on it could not see the audience. At the back of the platform was a huge blackboard marked off in feet and inches. Men who had been arrested on various charges during the previous twenty-four hours were lined up on this platform in the centre of which hung a microphone.

The audience consisted of detectives who were in a position to see the men without being seen. Some of them they might recognize as old acquaintances; the appearance of others they would memorize so that they could be recognized on future occasions.

The detective in charge, a lieutenant or captain (they have these ranks in America instead of Inspectors and Superintendents) sat at a high desk and called each man in turn to the centre of the stage. In a loud voice he questioned him about his present arrest and his past record. Often enough he had been able to get particulars of previous offences and could tell if the suspect was lying; at other times he would just bluff. Often he would ask outright if the man was guilty. The answers so taken are not used as evidence in court, but they often give valuable assistance to the officers in charge of the cases.

We do not allow such methods in England. Once a man has been charged with an offence, he may only be *invited* to make a statement on which he may not even be questioned, except to clear up any doubtful point such as, if he said seven o'clock, he meant morning or evening.

I haven't yet said anything about the police and

aircraft. In England they are not in regular use for police work, though occasionally they have been hired to assist in searches. Once or twice helicopters have been tried for regulating traffic, especially on Derby Day, but they were not found more successful than the normal methods of point duty and patrol cars.

New York City Police use aircraft for Harbour Patrol: if you take a look at a map of Manhattan, you will see the advantage of having an aerial survey of its huge waterfront.

# Chapter Twelve

## INSIDE THE LABORATORY

**C**OME with me on a visit to a Home Office Laboratory of Forensic Science.

The general lay-out in some of the departments will be quite familiar to you, for you will see bunsen burners, test-tubes, flasks and other apparatus used in the school lab. And used in the same way, only instead of the results being used to complete the answers in text-books or to help notes for exams, they are going to convict guilty people and acquit the innocent.

The heads of departments are scientists, some of them Doctors of Science. They have a certain number of assistants to help them, and all, as I told you earlier, are not police officers, but Civil Servants. We shall also find at the Laboratories one police officer who does not belong to the staff, but who is liaison officer between the police and the scientists.

Most of the work is done inside the Laboratories, but members of the staff are always ready to go out on a case where it is perhaps necessary to make tests at the scene of the crime.

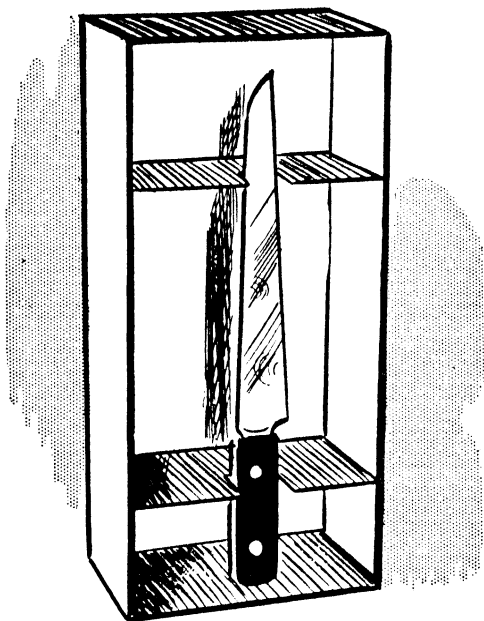
Let us suppose a murder has occurred. The



He called in the photographer and had pictures taken of it  
where it lay

police have their suspicions as to the murderer, but suspicions are not proof and they cannot yet make an arrest. They have, however, collected certain "exhibits"—that is, objects connected with the crime—and they want all the information these can give. The case I am dealing with is quite imaginary, so we can collect just what exhibits we choose as examples.

The victim was stabbed with a sharp instrument, and a bloodstained knife was found near the spot. The detective who found it in the lobby of the flat where the murder occurred did not at first touch it: he called in the photographer and had pictures taken of where it lay. Then he picked it up very carefully (*Not* with his handkerchief! He probably put a finger of one hand on the point and a finger



A special box fitted with rests so that the knife does not rub against the sides of the box when it is being carried

of the other on the end of the handle) and laid it in a special box fitted with rests so that the knife did not rub against the sides of the box when it was being carried and thus wipe out any fingerprints.

The knife goes first to the Fingerprint Department, but no prints are found on it, so it is carefully re-packed in its box. The box is labelled to give all particulars of how and where it was found, and by whom, and held ready to send with other exhibits to the Laboratories.

This (I told you it was quite imaginary) is rather a puzzling case. Let us say a wealthy company director is the victim and he was killed in his service

flat, where he lived alone. The discovery was made the next morning when the maid opened the door with a master-key to make the bed. Very little is known about the private life of the victim. He was accustomed to going out a lot, the hall porter told the detectives, but he never appeared to entertain friends at his flat.

The doctor who was called in said it was quite impossible that the victim could have killed himself. He was stabbed in the back and must have fallen instantly. So the detectives knew a second party must have come into the flat and committed the crime. The fingerprint experts have already searched the flat and developed many prints (most of them belonged to the dead man: they have taken his prints in order to check). Others belong to the maid who has also supplied her prints. The assailant has probably worn gloves.

Since there seem to be very few clues, the detectives ask experts from the Laboratory to visit the flat. They arrive within a few minutes of the call and bring with them a vacuum-cleaner. The floor of the living-room where the body was found is marked off into squares of, say, two feet, and a plan drawn of it. Each square is vacuumed in turn and the debris collected in a special bag which is numbered to correspond with its square. The flat does not have anything else to offer, though the bathroom has been carefully examined to see if the murderer washed his hands. There are no traces there. In any case the blow was struck expertly and

very little blood escaped past the victim's clothing.

The Laboratory men go back with their marked bags and the knife.

These exhibits are taken first to the Production Room where a file is opened for the case which gives a description of the exhibits, together with all known facts and circumstances. It is in the Production Room that exhibits are graded according to the specialized department to which they will be sent.

The knife is passed on at once to the Biological Department where the stains are analysed. They prove to be human blood and of the same group as the victim (I forgot to tell you the experts collected a sample of the victim's blood for comparison purposes). This confirms, as near as possible, that the knife was in fact the murder weapon.

There may be something more that the knife can tell. It is passed on to the Physical Department and examined under a low-powered microscope. Marks on the blade suggest that it has recently been sharpened on a steel such as is used for sharpening carving knives. Caught between the handle and blade is a single thread of harsh material. Under a slightly higher power of the microscope this proves to be wool such as is used for suits. The thread is labelled and put on one side; it may be very important presently.

The little bags of dust from the floor are also examined under a low-powered microscope in the Physical Department. They consist mostly of the sort of debris that is usually found on a floor—fibres

of carpet, fluff, minute particles of grit (ordinary house dust), slightly larger particles which have been carried in on shoes on a wet day, a few shreds of tobacco. But one bag yields quite an exciting find: this is a tiny burr—the sticky seed from a weed which fastens itself on clothing when you brush against it. Exciting because you don't brush against weeds on your walk or drive from the City to your flat near Regent's Park! It is possible that the murderer may have brought it in.

It isn't long before the tobacco fragments become exciting too, for the detectives have found out that the dead man was a non-smoker: there weren't even any ashtrays in his flat, and certainly no traces of ash or cigarette stubs.

The scientist examining the dust makes a guess at what happened. "Our man," he says, "came in wearing gloves. He was in a bit of a sweat after the crime and he pulled his handkerchief out of his pocket and wiped his forehead. Since he was wearing gloves, he was a bit clumsy—his hands would have been trembling, too. He dragged out the fragments of tobacco with his gloves and handkerchief. Probably knocked the burr off at the same time."

All this time detectives are working on other ends of the case. Some are making routine inquiries at the victim's office. They make a significant discovery here. "There is something rather odd about the account books," the dead man's secretary tells them. "The books are due for audit next week, and Mr. — (the dead man) always made a point of

checking those relating to our area representatives personally.”

“What’s odd?” asks the detective.

“Well, Mr. — always used to put the books on his desk for the auditors when he had checked them. They’re all there now except one book—the south-eastern area book—and that I found locked in his safe this morning. I have never known him do anything like that before.”

“Get your accountant to check the book at once,” the detective requests, adding, “is it always kept here?”

“Oh no,” he is told. “The area representative keeps it and brings it in personally once a year for the audit.”

Before long the accountant reports that the book seems in order, but there has been a big drop in the area sales—something like £500 from the previous year.

“And you say the representative was here yesterday?” the detective asks thoughtfully.

To cut a long story short, the area representative is visited at his home in a little Sussex town, and finally arrested. The detectives are pretty sure he is guilty, the object of his crime being to prevent Mr. —, who had evidently been suspicious of the drop in sales, from making any further inquiries.

It is, however, not necessary to establish a motive for a crime when a man is tried. Of course, knowledge of the motive helps the detectives to find suspects.



The accused man's suit is sent to the laboratory

Although the man is in custody, the case isn't complete. The police have to collect all the evidence possible, and they are helped at almost every turn by the Laboratories.

The accused man's suit is sent to the Laboratory, and in the pockets are found fragments of tobacco. Even more important is the fact that several burrs of the variety picked up by the vacuum cleaner are found in the turn-ups of the trousers.

With the suit come the shoes. Caught in the rubber heel of one shoe is a fragment of fibre identical with the fibres of the carpet in the flat. The area account book is examined by ultra-violet and infra-red light in the Physical Department. It is discovered that certain entries have been erased and new ones added in an attempt to cover up defalcations. The fragment of cloth caught in the knife is identical with the cloth of the suit.

Finally the detectives learn that the accused man is an ex-Commando. They now concentrate on looking for people who might have seen him in the vicinity of the murdered man's flat near the time of the murder.

The following points have been established, mostly with the help of the Laboratory staff:

1. The area manager had falsified the books, swindled his firm out of £500, and feared discovery by the dead man.
2. He was an ex-Commando, and might well have had a Commando knife which he had been trained to use.
3. He had been in London on the day of the crime.
4. A burr was found in the flat similar to burrs found on his clothing.
5. A fibre found on his shoe corresponded to the fibres of the dead man's carpet.
6. A fibre on the murder weapon corresponded to the suspect's suit.

Not a very strong case so far, perhaps, but a good start. I said it was imaginary, but every single incident has been taken from a real case.

The Physical Department is often called in to supply evidence in hit-and-run accident cases. A cyclist is found by the roadside; there are marks on his machine where something—probably a car or lorry—has struck it. Sooner or later, by a tedious routine of inquiries, the police find a suspect. The

wing of his lorry has a dent which corresponds to the mark on the bicycle. Men from the Laboratory find a tiny speck of green paint on the lorry wing which is cellulosed black. The bicycle was green.

Not very convincing? The Physical Department can do better than that. They scrape some paint off the bicycle and burn it in an electric arc. The light is passed through a spectroscope and the spectrum lines are photographed. The tiny speck from the lorry is also treated in the same way and the two photographs compared.

You may be surprised to learn that not only do spectographs of paints made by different manufacturers fail to agree, but even paints made by the same manufacturer at different times vary, and this evidence is fairly conclusive.

When death from poisoning is suspected, the Chemical Department takes the case in hand. Post-mortem examinations are not carried out in the Laboratories, but doctors performing them remove vital organs and send them for analysis. All "exhibits" so received are divided into three portions. The first portion is tested for volatile poisons by steaming and then analysing the condensed steam. Prussic acid, a very deadly poison, comes in the volatile group.

The second portion is minced and solvents are applied to separate out alkaloid and synthetic poisons. The liquid which is obtained is evaporated, leaving a residue of gum or crystals.

The third portion is also minced and treated with

a mixture of nitric and sulphuric acids. This mixture destroys all organic matter and combines with any metallic poisons that may be present to form salts. The salts can be analysed by chemical or, if the quantities are very small, spectroscopic methods.

Here is a story which shows that sometimes there is a lighter side to the grim work of the Chemical departments.

A farmer, much troubled with rats, received a call from a stranger who claimed to have a poison that would destroy them all without any danger to the livestock. The farmer paid £10 for the poison and carried out the instructions, which were to spread it on the ground near water. The rats would eat it, drink the water and die.

The next morning there were no dead rats, but the farmer's ducks were greedily gobbling the poison up! The ducks didn't die; they put on weight. Suspecting he had been "sold a pup", the farmer gave the rest of the "poison" to the police who sent it to the Laboratory.

It consisted of bran and nothing else!

I must tell you a little about the Police Laboratories in the United States and other countries.

Nearly every American police force has its laboratory, but since some of the forces are very small (I have found some consisting of four men, and I believe there are a few one-man forces), the laboratory may be no more than the corner of a room at headquarters.

Big forces have laboratories comparable with our own, and because guns so frequently figure in American crime, ballistics experts are kept well occupied. Outstanding is the Laboratory of the Federal Bureau of Investigation—the F.B.I. This has the finest equipment of any police laboratory in the world, and any American police force is entitled to send exhibits there for analysis and report.

Incidentally the F.B.I. does not send out detectives, or agents as they are called, to help other forces. These agents (G-men) are only concerned with Federal offences. The United States, as its name indicates, consists of a collection of sovereign, independent states, each with its own laws. Above these are certain Federal laws which apply to all States. They include kidnapping and automobile thefts where the cars are taken across a State border. Murder is a matter for the State in which it occurs, though the murder of a Federal agent becomes a Federal offence. The F.B.I. also keeps criminal records and fingerprints for the whole of the U.S., and any force can apply for information and checking.

In France there is one detective force for the whole of the country except Paris. This is the Sûreté. It has at its disposal several well-equipped and staffed laboratories, but individual detectives are more fully equipped and trained to deal with cases without technical aid.

# Chapter Thirteen

## DETECTION AND PSYCHOLOGY

EVERY detective is a psychologist, though he may not realize it himself.

I was chatting once to ex-Detective-Superintendent L. Rundle, who for many years was head of Scotland Yard's detective school at Hendon. Mr. Rundle told me how, as a young detective, he had once been sent to the Elephant and Castle district of London, to find a "little man with a pipe".

You might imagine that there would be hundreds of little men there, and that a great many of them would be smoking pipes. You would be quite right, yet Mr. Rundle found his man.

The reason for his success, Mr. Rundle explained, was that he was looking for something more than just a little man with a pipe—he was looking for a little man with a pipe *and* a load on his mind.

Police officers get to know how men with loads on their minds look! If you and I were constantly on the look-out for wanted people, we should get into the way of observing passers-by from a police angle. The man who knows he is wanted by the police cannot help his reactions when he sees a



He was looking for a little man with a pipe and a load on his mind

constable in uniform. He regards him as a danger and is at once on the alert. This state of mind prevents him from acting naturally, even though he is at special pains to appear natural and unconcerned.

Try to imagine what you would do if you were that man. Perhaps you would overdo the unconcerned act and walk quite close to the policeman, maybe you'd even give him a "good morning". On the other hand you might take great care to avoid him: you'd cross the road for no apparent reason, suddenly take an interest in a shop window, or dodge behind a stationary car.

The experienced police officer just can't help noticing passers-by like that, and when he does, he takes a closer look to see if they are on his list of wanted persons.

That's psychology in action.

Scotland Yard—and indeed almost every police force—has a “*modus operandi*” file. “*Modus operandi*,” as you probably know, is the Latin for “method of working”. It is a very important file because it describes the technique of all convicted crooks, and a great deal more information as well about their haunts, hobbies and habits.

As a general rule crooks stick to one type of offence throughout their criminal careers. The safe-breaker continues to break safes, the cheque forger to forge cheques, and the warehouse breaker to break into warehouses. That isn't all: each crook continues to carry out his offences *in the same way*. The man who burgles a house by climbing up a stack-pipe will continue to climb stack-pipes, even after he has been caught and convicted. An experienced detective can often tell from his examination of the scene of the crime who the criminal is.

Of course that knowledge is not sufficient to secure a conviction. When an accused person is tried in England, the jury must know nothing about any previous offences in case that prejudices them against him for the case that is being tried. The prosecution has to prove that he committed this particular offence, and the detective is not allowed to say that Bill Sykes makes a habit of committing this type of crime so he almost certainly did the one in question.

Why don't crooks change their methods?

That isn't easy to answer, and it is certainly some-

thing that lies in the science of psychology. I have spoken to both detectives and crooks about it, and my own idea is this: having decided on a criminal career, the young crook often imitates a more experienced crook under whose influence he has come. That decides him on the type of crime he will adopt. He copies the older man's methods, adding touches of his own. Sooner or later he is caught. In prison he tries to figure out where he went wrong (unless he has really decided to go straight). He is now a man with a criminal record, and if he is caught again, he will get a much stiffer sentence. He doesn't want to try a new type of crime or a new method, because he thinks he would be more liable to be detected, so tries to perfect the method he has already adopted. When he is free to commit another crime, he does just what he did before. Soon he establishes his crime pattern, so that it becomes like a private trade mark to the detectives.

This queer psychological fact helps justice enormously, and the card-indexing of crooks and their ways is certainly a science. In addition to having his name filed on a master-card, the convicted person is also listed in dozens of different ways. He is filed according to his type of crime, method of committing it, height and hair colour, as well as according to any peculiarities of habit and dress, and of any scars or distinguishing marks. One crook I know of boasts about his brother's wonderful career in the Navy. Even this is indexed, and it has caught him more than once. He lives in London and

specializes in burglary in country districts. He can't keep out of pubs, and sooner or later he'll start telling someone about his brother. When the detectives make inquiries about the burglary, they'll be sure to ask whether anyone has seen strangers in pubs or cafés: the "brother" conversation will probably come out, and the card index at headquarters will give them a strong hint who to look for.

Is there a criminal type? To-day most psychologists agree that there is not, but sixty-five years ago an Italian doctor named Lombroso put out a theory that criminals were foredoomed to commit crimes, and that they could be distinguished by the shapes of their heads. He went even further and declared that he could tell from their head measurements exactly what type of crime they would commit.

A great many people believed his theory: others rejected it (very few people believe it to-day), but they did begin to wonder what impelled people to commit crimes. Was it due to something in their mental make-up that they couldn't help? men asked. This was a big step forward. For thousands of years punishments had been laid down to fit the crimes and not the criminals. There was a fixed punishment for burglary, another for cattle-stealing, another for setting fire to property. Now lawyers and judges began to consider each offender on his merits. Were there any special circumstances which increased the temptation to crime, or made it difficult to resist that temptation? Punishment became more humane, and at the same time more effective.

The oldest and least worthy reason for punishing an offender is revenge. Society's rules have been broken, and the breaker must be made to suffer. To-day most people recognize that punishment has three main objects: to protect honest people, to cure the criminal of his ways, and to discourage others from following his example. It is generally accepted that savage punishment is far less successful in stopping crime than is the certainty of detection.

A hundred and fifty years ago more than a hundred offences were punishable by death. It didn't stop crime, in fact it increased, and the savage laws often induced juries to bring in verdicts of not guilty, while desperate criminals, knowing they could be hanged if caught, used so much violence that men were afraid to catch them. The police of the day were inefficient and often themselves dishonest. Although hundreds of people were hanged, including quite young boys and girls, thousands more went unpunished.

When Sir Robert Peel introduced his famous Police Bill, and Parliament authorized the establishment of a properly paid and equipped police force in London in 1829, crime figures began to decrease, although at the same time penalties were made less severe. Crooks knew they would probably be caught and that they could no longer buy or shoot their way to safety.

But this doesn't answer the question of why certain people take to crime. A hundred years ago a certain number of people stole because they or

their families were actually hungry. In England, at least, there is very little excuse for crime on these grounds to-day, yet people still steal. It was fashionable a hundred years and less ago to blame drink for many crimes, and certainly drink inspires Dutch courage in some timid characters. To-day excessive drinking is regarded more as a symptom of an unsettled mind than as a cause of crime.

More and more people are realizing that much—not all—crime is the fault of society itself, and that maladjustment is the largest factor. Folks who feel themselves inferior for some reason are apt to try to find compensation by spectacular and unlawful acts. All men and women are not born with equal and identical abilities, and it is up to society—which is us—to give everybody not just an equal opportunity, but an opportunity to develop in the way that is most suited to individual talents.

A youth ambitious to become an engineer, for example, and compelled to copy figures in a business office may well feel frustrated and wasted. If he has not been taught to adjust himself and to find recreation and hobbies that satisfy him, he may be tempted to feel society has defrauded him of his rights and take revenge by anti-social acts of crime.

I remember well the case of a girl who was extremely clever and extremely ugly. Nobody had explained to her that she could win respect and admiration by using her brains, so she used to steal in order that she could make lavish presents and wear better clothes than her companions.

Detectives, and indeed most police officers, understand very well the causes that make for crime, and are often very sympathetic. I have known them spend their own time and money to help convicted crooks and their families.

But it is no part of the duties of the police to discover the reasons for crime: they have first to prevent it if possible, and second to detect and bring to justice the offenders. The duty of providing conditions for everybody in which crime will be both stupid and unnecessary belongs to society.

And society, as I have said, is you and I.

# Chapter Fourteen

## A FEW MORE CASES

MURDER, as you now know, makes up a very small part of crime. Day in and day out, the detectives are engaged on less striking cases that seldom make headlines in the newspapers. Many of them you never hear about at all.

Here is a case which occurred in a large South Coast town a few years ago. I have chosen it because it illustrates almost every aspect of detection—observation, scientific research and just plain persistence.

There had been an outbreak of safe robberies along the South Coast. The operators had not been very ambitious, but had chosen the safes, which were not of the highest quality, in small lock-up shops. The amounts they contained varied from a few shillings to forty or fifty pounds, but in the aggregate the thieves were making quite a large income.

All the safes had been opened in the same manner, but apart from that the detectives had nothing to guide them: the men (there was evidence from the method of opening that two at least had been engaged on the jobs) were newcomers to crime. They did not even leave fingerprints.

All detectives will admit that luck sometimes

gives them a break, and luck certainly stepped in at the right moment in this case. But it took a keen detective to realize that luck when he saw it.

It happened this way: a detective in one of the towns where safebreaking had occurred went into a tailor's shop to buy himself a new suit. The tailor knew him, and said he had a little problem on which he needed advice.

"Go ahead," the detective invited.

"Well, a few days ago two young men came in and bought new suits. They put them on in the shop and said they would call back later in the day for their old clothes. They haven't been back. I want to know if I can get rid of the old suits."

That detective had a hunch. "I'll take the suits off your hands," he said. "In fact they may be just possibly the suits I'm looking for."

He took the two suits back to his own headquarters. They were certainly not new, but clothes were still very expensive and these were worth two or three pounds each. From the tailor's description of the young men, they were not the sort to have money to throw away.

The detective superintendent was interested enough to have the suits sent at once to Scotland Yard's laboratories for examination. He was still more interested when the report came back. The suits had been vacuumed as a matter of routine and the dust from them examined. In the dust were found fragments of paint and metal, and a few crumbs of sawdust. Because the Yard Laboratory

has a collection of every type of wood in commercial use, the experts were able to say that this particular sawdust was sometimes used as packing in the metal sides of safes. It now seemed as if the police had at last found a clue. They sent up to Scotland Yard specimens of paint from the safe which had most recently been forced, together with sawdust which had come out of it. A further report came back that both paint and sawdust found in the dust from the clothes were identical with those from the safe.

It was now reasonable to suppose that the owners of the suits had been responsible for the robberies, but there was no clue as to who they were, or where they had gone.

Now for the plain persistence part of the story. When ready-made suits are put together in the factory, the manufacturer has a trade-mark sewn inside, under the lining. The lining was opened, and the trade-marks were found. Both suits had been made by a manufacturer in the East End of London. So had hundreds of other suits! First the detectives had to obtain a list of the shops to which suits made of this particular cloth had been sold. There were dozens, all over the country.

Since the robberies had occurred on the South Coast, the detectives decided that the wanted men either lived there or in London. They concentrated on those areas first, and called at all shops that had handled the suits. At last their perseverance was rewarded: in the Woolwich area they found an out-fitter who remembered selling two such suits to two

young men. The detective who called gave the outfitter the rather vague description of the men he had received from the tailor where the suits had been left behind.

"That could be them," the outfitter nodded. "Yes, I think it is. I can give you their names and addresses, if you're interested."

"Interested!" exclaimed the detective. "How do you come to have them?"

"That's easy: they bought the suits on hire purchase," came the answer. "So of course I have their names and addresses."

"You're sure they gave their correct names and addresses?" the detective asked.

The outfitter grinned. "Mister, do you think I part with good suits till I've checked up? Sure they're correct. I got the boss of one of the lads to vouch for him: he's Mr. —, the butcher in — Street."

After that it wasn't long before the two young men were found and questioned. Each had on him quite a large sum of money which he declared he had won backing greyhounds. The tailor identified them as the two who had left their suits behind, and indeed neither denied it. They had made plenty of money betting, they said, and didn't want to be bothered with the old suits. Asked to explain the fragments of paint and the sawdust found in their suits, they attempted no explanation of the paint, but said the sawdust must have come from the floor of the butcher's shop where they worked.

This meant quite a lot more hard work. The men

certainly had worked in a butcher's shop: it was not merely necessary to prove that the sawdust was the same as that from the safe, it was also necessary to prove that the sawdust was *not* the same as that used by the butcher. All the sawdust the butcher had bought over a long period was checked with the firms that had supplied it, and details were taken of the woods that had been sawn up to make the various batches. At last there was enough evidence to arrest and charge the two young men. But not enough, perhaps, to convince a jury. Once they were in custody and had made a statement, the detectives got busy and checked every word of it. They visited lodgings where the men had stayed, questioned shopkeepers and publicans, and at last had complete details of where the statement was true, of where it was false, and of where it couldn't be proved one way or the other. From this they learnt that at the times when at least the more recent cases of safebreaking had occurred, the men either failed to prove their whereabouts or had told deliberate lies.

When, finally, they were brought to trial, they were found guilty.

That's real detection for you. A detective once described his work to me as "Ten per cent inspiration and ninety per cent perspiration". He added: "Very often you can substitute luck for inspiration."

A rather unusual case of murder occurred in London in April of 1941. During that year the public and the newspapers had plenty besides crime

to occupy their minds, but the police still had to deal with crime as well as with many other duties that war and the blitz imposed. The murder was not discovered until July 1942, and when you hear details of the case you will agree that although it was not difficult to guess who the culprit was, proving guilt required patience, skill and science.

It was on July 17th that workmen were tidying up a disused and bomb-damaged chapel in Kennington, London. One of them pulled up a loose paving stone in the cellar under the vestry and was horrified to find a skeleton there. The police were, of course, called, and the remains were examined by Dr. Keith Simpson, the famous pathologist. Parts of the body, he found, were missing, and an attempt had been made to prevent identification. He considered that death had occurred about eighteen months before the body was discovered, and that it had been exposed to fire after death.

He discovered something else that was of the utmost importance. In the human throat is a small bone known as the hyoid which is found at the base of the tongue. It is U-shaped and quite fragile, but it has never been known to have been broken except by pressure in cases of strangulation by hand. Its fracture is, in fact, the most reliable sign that strangulation has taken place when the body is too far decomposed to show other signs.

From this he concluded that the victim (it was a woman) had been murdered.

Strangely enough the police already knew some-



One of them pulled up a loose stone and was horrified to find  
a skeleton there

thing of this case before the body was found. They had a record that a fire had broken out in the chapel on April 14th, 1941, although no incendiaries had been dropped in that area. They knew that a fire-watcher named Harry Dobkin had been employed by a firm of solicitors to watch premises next to the chapel—and they knew that Dobkin's wife had been reported missing on April 12th, 1941. They had taken a statement from Dobkin who had told him that he and his wife were separated and that he last saw her on April 11th, 1941, when she boarded a bus for Shoreditch.

Dr. Keith Simpson was able to give a detailed description of the body. It was that of a woman about 50 (Mrs. Dobkin was 49), half-an-inch over

five feet in height, with dark brown hair going grey.

All these details suggested that the body was probably that of Mrs. Dobkin, but they didn't prove it. During the blitz many people disappeared, and some were later found dead as a result of bomb injuries or the fall of masonry. Of all London's millions, there might well be several who answered the general description of Mrs. Dobkin, and one of these might have been killed by the blitz while sheltering in the chapel. She couldn't have put herself under the paving stone, but that in itself was no proof that Dobkin did it—unless it was in fact his wife. If it was, the supposition that he did put her body there would be so strong that a jury would be likely to accept it.

And it *could* be proved that the body was that of Mrs. Dobkin. Although the lower jaw was missing, the top jaw was of an unusual shape and contained false teeth. The owner must therefore have visited a dentist, and the dentist would have a model of the jaw on which he fitted the denture.

Mrs. Dobkin's dentist was questioned, and he was able positively to identify the jaw as belonging to his former patient.

Harry Dobkin and his lawyers fought every point of the evidence, but the experts were too strong for them, and Dobkin was found guilty. The jury took only twenty minutes to reach their verdict.

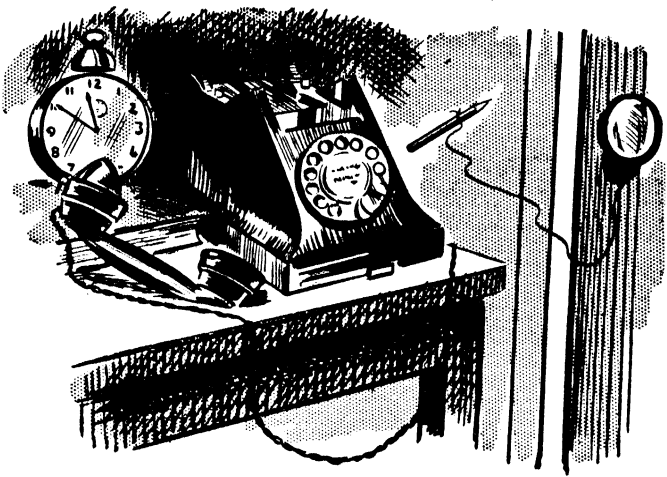
You may think that once a body has decayed to a skeleton, identification is impossible. But it is possible, and many times in recent criminal history

a dentist has supplied the proof of identity. Every year more and more people visit dentists and accurate records are kept of their teeth, especially where artificial teeth are fitted. But, even without this evidence, identity has sometimes been established long after death.

The flesh and skin on a human head is of a certain depth, and this varies very little from individual to individual. Sometimes a face has actually been reconstructed on an unknown skull by building it up with plastic material so successfully that friends have been able to recognize it.

In the chapter on Modern Aids to Crime Detection I told you about an instrument that rings up police headquarters and informs them that the premises are being burgled. Not so long ago a detective, acting on his own initiative, caught a determined thief who had been robbing a country club.

This club had been raided many times at night, and the raider was always too clever to be caught. The detective in charge of the case hit on a plan to make the thief catch himself. Each night, just as the club had shut, the detective went to the telephone and dialled the letters and all the numbers of the nearest police station except the last figure. Then he pushed the dial back to the final figure and held it there by wedging it lightly with a pencil. He tied one end of a long thread to the pencil and the other end to the handle of the door. The telephone instrument was, of course, taken off its cradle, and he put a loud-ticking clock beside the mouthpiece.



Sure enough the trap worked one night

Sure enough the trap worked one night. The thief broke into the club and opened the door of the office where the telephone—and the money—was.

As the door opened, the thread pulled the pencil out of the telephone dial which spun back to rest. The telephone line had been “held” at the automatic exchange by the incompleted call, but the moment the dial was released, the circuit was completed and the bell rang at the police station. The sergeant in charge who answered the telephone lifted the receiver and heard the clock ticking. He had been warned, and knew at once where the call came from. A patrol car was on its way within a few seconds, and the thief was arrested without any idea that he himself had called the police!

As a matter of fact I have tested this idea myself. You’d better take my word for it. Except for good and sufficient reasons, the Post Office doesn’t like its telephones tampered with!

Devoid by :-



~~50/1672~~

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